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ABSTRACT

The Public Access Library System (PALS), a two-way cable television system for the delivery of community information, was developed by the staff of the Pasadena Public Library working with a consultant under a 1-year Library Services and Construction Act (LSCA) grant. The objectives of the project were to: (1) identify six potential databases that would meet the information needs of the local area residents; (2) outline the hardware requirements for such a system; (3) detail the software needs and develop an implementation program; (4) develop costs and identify potential funding sources; (5) investigate the possibility of a cooperative program with another area library; and (6) prepare a report of the project for publication. A comparison of the original proposal with project activities shows that all of these objectives have been successfully met. Project accomplishments include the design of an experimental format for several local information databases and the design of a communication and delivery method that will reach a broad sector of the community either directly, through home cable television or microcomputers, or indirectly, through the same media at such facilities as libraries, public recreation facilities, and schools. The implementation phase of the project is scheduled to begin in 1985. (BBM)

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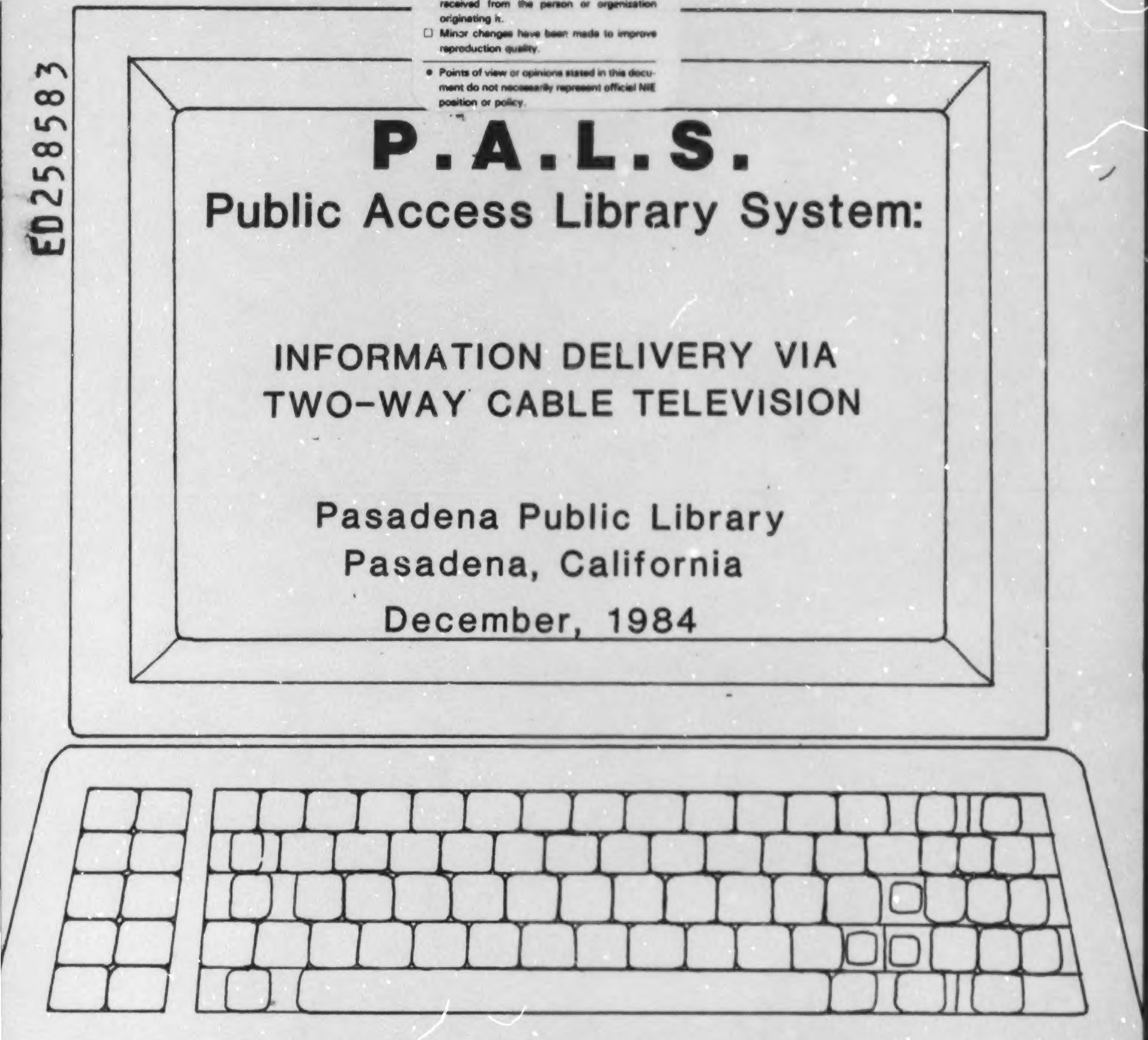

P.A.L.S.

Public Access Library System:

INFORMATION DELIVERY VIA TWO-WAY CABLE TELEVISION

Pasadena Public Library
Pasadena, California
December, 1984

study funded by the library services and construction act

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PUBLIC ACCESS LIBRARY SYSTEM:

Information Delivery Via Two-Way Cable Television

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This study was made possible by a grant from the Library Services and Construction Act.

Issued
December, 1984

PROJECT ABSTRACT

One of the major recommendations of a recent analysis of the information needs of the Pasadena community was that the Library serve as a clearinghouse for community information. In 1983, presented with the opportunity to provide an innovative cable service, the staff of the Pasadena Public Library prepared a Library Services and Construction Act grant to plan the delivery of local information via two-way interactive cable television. The grant proposal was designed to provide other libraries with a plan for delivery of local information via cable television.

The objectives of the project were to:

1. identify six potential databases that would meet the information needs of the local area residents;
2. outline the hardware requirements for such a system;
3. detail the software needs and an implementation program;
4. develop costs and identify potential funding sources;
5. investigate the possibility of a cooperative program with another area library; and
6. prepare a report of the project for publication.

The Public Access Library System (PALS) was developed by the Pasadena Public Library staff and a project consultant to meet these objectives. A model database was created, serving as a blackboard for the staff to design the system and develop the plan. Due to the success of the planning project, the Pasadena Public Library will be proceeding to the test stage, implementing two of the local databases early in 1985.

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I. PROJECT HISTORY

> The freedom to know is the foundation of our democracy. The mission of the Pasadena Public Library, a basic municipal service, is to be an information center for the Pasadena community in order to preserve and encourage the free expression of ideas essential to an informed citizenry.
>
> Mission Statement, Pasadena Public Library.

This mission statement of the Pasadena Public Library was formulated in January 1983 when the staff of the Pasadena Public Library completed an extensive study of the Pasadena community and its information needs. The goal of the project was to develop a five-year plan for library services that matched the library's services with the community's information needs, given its changing composition and interests. What emerged from this "Community Analysis" project was a portrait of a highly diverse multi-cultural community with a wide range of constantly changing interests.

This paper reports the results and present status of a one-year Library Services and Construction Act (LSCA) project called the Public Access Library System (PALS). The PALS project carries forward two of the major recommendations of the Community Analysis study: that the Library serve as the focal point for the provision of information about the community, utilizing new technological developments to improve the collection, organization and dissemination of information, and that the Library develop home delivery of community and library information services in order to reach a broader segment of the population. The goal is to make information available in one location that was not previously available or was located in a bewildering array of sources. Equally important was the desire to disseminate this information widely throughout the community, reaching out to those who do not presently use the library's resources.

Motivated by this desire to increase public access to library resources, the Pasadena Public Library has been involved in the planning of cable services for Pasadena. It is common for libraries to broadcast programs on cable television. The Pasadena Public Library wanted to explore the possibility of providing interactive information delivery to Pasadena residents via cable.

In the Fall of 1982 circumstances came together to provide the propitious moment for this innovative departure. Preliminary findings from the Community Analysis study indicated that the Library was not adequately meeting all of the information needs of the Pasadena residents, particularly those with low income, the unemployed, senior citizens and the physically handicapped. At the same time, the City of Pasadena was in the process of obtaining bids for a cable TV franchise that would include two-way interactive communication.

The need to discover how interactive information delivery could be best utilized led the Library to apply for an LSCA grant for 1983-84. The application was successful and the Library received $30,500 in LSCA funds through the California State Library to hire a consultant to work with Library staff in planning a model for the home delivery of community-specific information services via interactive cable. The primary LSCA priority was to redress the problem of the inadequate dissemination of library information to city residents. Other LSCA priorities include providing information to low income persons on employment opportunities, job training and educational programs, and enabling physically handicapped persons and senior citizens to obtain information that addressed their needs and would be available to them at home.

The specific objectives to be met during the course of this project were: (1) to identify at least six areas of user need where the Library might appropriately respond through the development of databases; (2) to construct detailed plans for implementing and maintaining these databases; (3) to develop technical requirements for hardware; (4) to explore the feasibility of interconnection via cable with at least one adjacent library system; (5) to identify costs and sources for funding the proposed database; and (6) to prepare an article describing the scope and nature of the project.

The original timetable for the project, as outlined in the grant proposal was adjusted due to turnover in a key staff position and the subsequent delay in hiring a consultant. The project consisted of three phases: Phase I, from March 1, 1984, to May 15, 1984, addressed software planning; Phase II, completed July 31, 1984, consisted of hardware planning; and Phase III was the report preparation phase to be completed by September 30, 1984.

II. PROJECT DESCRIPTION

The PALS system is designed to provide users with information about the various organizations, resources and services available in the Pasadena community. In order to explore the feasibility of making this community information service available at home, library staff and the project consultant designed and developed a model system that includes a limited amount of local information not available elsewhere. The following six databases are included in this model system:

-Decision Makers: lists members and meeting information for local government, boards, committees and commissions.

-Statistics: contains local statistics relating to population, education, crime, housing, employment/unemployment, health/vital statistics.

-Calendar of Events: a calendar of community events emphasizing cultural and musical events, seminars,workshops, lectures, entertainment and children's programs.

-Businesses: facts and figures on individual local companies, including products and services, financial information and officers.

-Community Organizations: listing of local clubs and organizations as well as human services such as legal aid, health and consumer information, services for seniors, daycares, and hotlines.

-Library Resources: access to the Library's listing of books, periodicals, documents and audio-visual materials.

Access via cable television has been thoroughly investigated and will be implemented as the two-way interactive capability becomes available to Pasadena cable users on the system presently being installed by Falcon Cable TV. The system is designed to provide additional access from major types of terminals and microcomputers located in homes and in a variety of locations throughout the city, including the Central Library and branches, schools, recreation centers, and senior citizen facilities. A phased plan outlining a projected timetable is described in detail in the Implementation section of this report.

The Pasadena Public Library is not unique in its creation of local databases. One aspect of the Pasadena project, however, that is unique is the active involvement of the community. Community participation occurred at a variety of levels. First, the selection of the six databases identified above is the direct result of community input. Secondly, the system is designed so that organizations in the community may be directly involved in updating the information in several of the databases, such as the Calendar of Events. Finally, several members of the community and City staff have seen demonstrations of the system and have had the opportunity to provide suggestions and comments. To date, the following people, in addition to the Library staff, have viewed the model system:

Bob Beech - Data Processing Coordinator, City of Pasadena
Bill Bogaard - Mayor, City of Pasadena
Hal Bray - Pacific Bell
Glen Brooks - Community Services Coordinator, City of Pasadena
Collin Clark - California State Library
Bonnie S. Collins - Library Board
Joanne Fillpot - Sr. Administrative Analyst, Employee and Community Services Agency
Robert Finch - Past President, Pasadena Chamber of Commerce
Gracia Gutierrez Friesema - Library Board
Roger Greer - Dean, USC School of Library and Information Management
Patricia Grisinger - Library Board
Marty Hale - USC School of Library and Information Management
Staajabu Heshimu - Library Board
Diane Johnson - Fire Department, Member Office-Automation Committee
Marne Ladig - Pasadena Arts Council
Victor LaRuccia - Telecommunications Administrator, City of Pasadena
Nancy Lehner - Correspondence Center, Member Office Automation Committee
Bill Lewis - Director of Employee & Community Services Agency
Shirley Mauller - Library Board
Don McIntyre - City Manager, City of Pasadena
Wayne Mullin - Project Manager, GEAC Computers, Inc.
Lee Paul - Library Board
Anne Pursel - League of Women Voters and Library Board
Jack Ramsey - Director, Glendale Public Library
Ron Spang - former Computer Services Administrator, City of Pasadena
Carol Spencer - City Managers Office, Member Office Automation Committee
Pam Swift - City Clerk, City of Pasadena
Richard Urban - Public Works Department, Member Office Automation Committee
Jerry Varcak - Pacific Bell
Barbara Weitkamp - Finance Department, Member Office Automation Committee

This is an ongoing activity and further demonstrations are planned. Clearly, the success of this system depends upon our ability to foster cooperation between community groups and individuals.

Staffing of the planning project has been multidimensional. Branch Librarians and Central Library staff members from all departments (Public Service, Reference Service and Technical Service) had input into the design and scope of the project. The Library steering committee for the project included Ed Szynaka, Library Director; Liz Bishoff, Principal Librarian for Support Services; Anne Cain, Principal Librarian for Reference Services; and Marilyn Parrish, Reference Librarian. Other staff members involved in the development of various databases included Ellen Robinson of Adult Services; Dan Crump, Daniel Hanne, Joan Kennedy, and Ted Olsen from Reference Services; and Branch Librarians Pam Groves and Janet Woo.

The steering committee was responsible for the overall direction and coordination of the project. Weekly meetings with the consultant provided the opportunity to define system requirements such as data input and updating methods, database size, and indexing and output requirements. We discussed the potential user of the system from the library point of view and in terms of hardware used to access the system. We also discussed the implications of such issues as copyright and privacy.

Each of the five databases was assigned to a member of the steering committee for supervision. Staff members involved with each database met together and with the consultant to determine the scope and content of the databases. Additional considerations included screen format, sources of information, audience, data entry methods and procedures, policy statements, and evaluation.

In the Fall of 1983, the Pasadena Public Library conducted an informal request for proposal process in order to select a consultant to work with Library staff. In January, 1984 after careful consideration of the four candidates who responded to the Library's Request for Proposal, Ed Stevens, of EMDA, Inc. was selected as project consultant. Mr. Stevens is currently developing software and hardware interfaces for the Data Pipeline, a project allowing microcomputers to communicate with a central "computer station" in order to access information in local databases. His work in this area has allowed him to develop a hardware system based on the linkage of microcomputers which result in a design of high reliability and low cost.

III. COMMUNITY ANALYSIS

In May, 1981, the Library staff embarked on a two-year project that consisted of two parts: an analysis of the Pasadena community and another of the Library itself. The research strategy for the community portion of the study consisted of compiling a demographic analysis supplemented by extensive interviews with 340 organizations in the community and focused on four main components. The first was a demographic profile of the Pasadena population and the kinds of information needs individuals had. The second looked at groups in the community - ethnic, hobby, recreational, social, political - and their special information requirements. The third component consisted of the various agencies - governmental, cultural, and corporate - and what the Library could do for them. Finally, the project staff looked at the general lifestyle of the community - what it is that makes this community unique, what is important to the people who live here, and how important is the Library in their lives.

The findings and recommendations of this project were incorporated into a five year plan for library services entitled Essential to an Informed Citizenry...The Pasadena Community and Its Information Needs: A Program for Pasadena Public Library Services issued in April, 1983. This report confirmed for us some of our impressions about the community and library services and provided some new insights as well. Two interesting observations came from the interviews with community groups and constitute the philosophical basis for the PALS project. One perception gathered from the interviews was that the Library does what it does very well but that not enough people know about it. The groups contacted were favorably impressed with the Library's level of service, its extensive book collection, and the knowledge and helpfulness of its staff, but felt the Library needed to publicize these services more extensively. Another parallel perception was that the Library provides traditional services well but that it needs to undertake a more active and visible community outreach program. Rather than merely making available books and other materials, there was a clear mandate to emphasize community information.

The recommendations of the report were arranged under nine major goals, 42 objectives and 124 action items to implement them. The PALS project is designed to address several major recommendations of the study that the Library:

.Serve as the community's information utility - the focal point for provision of information about the community.

.Design user-oriented library services, emphasizing access to information, and including home delivery of information.

.Utilize new technological developments, including Cable TV, to improve the collection, organization and dissemination of information.

The PALS project addresses the following specific activities identified in the report:

GOAL A: The Pasadena Public Library will develop a user-oriented library. Any barriers to use, including physical, language and cultural barriers, will be eliminated or minimized. In addition, library facilities, collections and services will be designed to be as self-service as possible, since many library users do not ask for assistance in using the library. Emphasis will be placed on continual evaluation of accessibility of the buildings and collections and use by the public, with attention given to the needs of the handicapped.

OBJECTIVE 4: Expand services for those who cannot come to the Library (i.e. the homebound, those in nursing homes and institutions).

ACTION ITEMS:
Provide accessibility to library service for the homebound and those in institutions via cable television.

GOAL C: The Library will serve as the focal point for provision of information about the community, utilizing new technological developments to improve the collection, organization and dissemination of information.

OBJECTIVE 1: The Library will act as a clearinghouse for providing and gathering information about groups and events in the community.

ACTION ITEMS:
.Develop and maintain an online community resource databank, which will consist of a current directory of local organizations and social service agencies, with provision for subject access.
.Develop and maintain an online community calendar of events.

OBJECTIVE 2: Act as prime agent for centralizing, consolidating and disseminating statistical data about Pasadena.

ACTION ITEMS:
.Design and develop a computerized database of current statistics: demographic, economic, employment, education, housing.

GOAL G: The Pasadena Public Library will continue to incorporate new technologies and adapt new methods of obtaining information which are vital to its function as the community information utility.

OBJECTIVE 3: Develop home delivery of community and library information services in order to reach a broader segment of the population.

ACTION ITEMS:
.Develop plans which identify the services which will be made available via cable, and a timetable for implementation.
.Implement plans for home delivery of information.

IV. COMMUNITY ACCESS

One of the primary goals of the PALS project is to respond to the Community Analysis objective of expanding library service. Traditional approaches to library use fall into three categories - in-library use, where the user visits the Branch or Central Library to select a book or obtain information; telephone access, where the user calls the library requesting a particular piece of information or availability of materials; and home delivery, where a staff member or volunteer delivers materials to a homebound user, or a group of users at a nursing home or a school. With resident registration rate in September, 1984 at 53.4% of the population, an addition to in-library use of the library had to be developed to broaden the user base of the Pasadena Public Library. The introduction of cable television presents a new option for the delivery of information and may increase the number of library users.

In the preliminary research for the project, it became evident to the steering committee that dissemination of information in the next decade must be viewed from the broadest possible perspective. All mediums of communication need to be considered in the delivery of information. Advances in telecommunications are opening up options not previously considered for information dissemination several years ago, including cable television, telephone, microcomputers, printers and terminals. Where once these devices were costly, they are now affordable; where once these access mediums were exotic, they are now common. If the Library is to reach into the homes, offices and schools to deliver information it must use all viable modes of delivery and not be limited to those widely available today. With that understanding, it became clear that we had to design the access to the Library-developed local databases to allow for the broadest possible access media. The type of user, as well as the evergrowing variety of access modes, had to be considered in the planning of the databases.

PALS will be accessible at the Central and branch libraries by patrons and staff, through public use CRT'[illegible] Additionally, the public will be able to access PALS from their homes via the public access cable channel; or in the dial access mode from the home or office via microcomputers or CRT or printer terminals. Cable television access and/or terminal access will be made available in a variety of locations throughout the City - recreation centers, schools and City Hall.

Access to the local databases designed to meet the needs of Pasadena residents must be available in the Library. As we analyzed the user needs, it became evident that many needs could be satisfied by locally created files and directories such as the community organizations directory, statistics file, Decision Makers, and the GEAC bibliographic database. Entering these existing local files as the basis for the local database logically evolved into a staff tool replacing the print files and booklets. By putting previous Library reference files online, we could now provide access to this information by both staff and patrons at all branches and departments of the Central Library. This information would be current and easy to update from all sites. In addition to staff access, in-library public access is a must. Acknowledging the fact that many users do not ask for assistance, providing public access to many files presently available only to staff will facilitate patron retrieval of information.

In-library public access use of the databases however does not address the issue of broadening the library's service base beyond the library facilities. With the primary purpose of the project to reach out into the community, the steering committee felt that the plan should include access from remote locations.

After discussing PALS with various community leaders, City staff, and Library Board members, it became evident that placing dedicated and/or dial access terminals or using existing terminals in recreation centers, schools and City Hall would be a natural extension of the information system. Locations such as the recreation centers in low income areas will more directly reach the target audience. The data in PALS allows residents to locate essential health, consumer, job and educational information. Additionally, this information is useful to the community service staff in assisting residents. Centralizing community referral data in PALS would provide a single, up-to-date comprehensive list of social service agencies, community activities, local statistics, housing information, etc.

As the Falcon Cable TV system installation connects to the various City agencies, including recreation centers, two-way transmission of information can be provided as an alternative or additional method of accessing PALS. It is possible that staff will use terminals to both access and maintain the databases, while the public will access PALS using the cable system.

Cable television has the potential for the greatest impact. Falcon Cable TV anticipates that 40% of Pasadena homes will subscribe to cable services.(1) One of the strong points in favor of cable is that it does not incur significant additional telecommunication costs and does not tie up the telephone. However, modems and keyboard devices to be used in the two-way interactive cable system are still in the development stages. Widespread use of two-way will depend on a readily available, reasonably priced product.

The final access mode considered by the steering committee in designing the system was dial access by microcomputer owners from their homes and businesses. Although the original grant proposal did not suggest home use via dial access, this mode of information dissemination is a logical addition to the cable access and dedicated terminal access without altering the project proposal.

The system design allows the user to indicate the type of microcomputer (IBM, Apple, TRS-80, etc.) and if they have less than an 80-column screen. Keyboard commands are not type-of-terminal dependent, which allows broader use. Although microcomputers have been acquired by only 6% of the population nationwide, by

1990 a 70% penetration is anticipated.(2) Add to that the small but increasing number of electronic services available to the microcomputer owner - banking, shopping, travel arrangements, database searching, electronic mail, allowing dial access to PALS.

IV. CABLE AND TELECOMMUNICATIONS

The history of cable development and of cable franchising in this country is closely tied to government regulation. Cable technology was developed in the 1940's to provide better reception to rural areas for commercial television. Franchising of cable systems developed because cable operators had to obtain a permit to run their cable along the public right-of-way.

The first regulation of cable systems came in the 1960's by municipalities that were eager for franchise fees. Abuses occurred on both sides. Often cable companies did not meet conditions agreed upon in contracts. The 1970's saw regulation by states and the Federal Communications Commission (FCC). The FCC wanted to ensure planned development of cable systems which would meet certain compatibility and access requirements. Regulation eased after this period because it was perceived as a burden to cable growth.(3)

The "Cable Communication Policy Act of 1984" was passed by Congress on October 11, 1984 and signed by the President on October 30, 1984. This Act combines provisions of House Bill 4103 and Senate Bill 66 and establishes the first national policy for cable television. It elucidates the role of local government in cable television regulation through franchises; permits cities to set requirements for the use of public, educational, and government access channels; ends local rate regulation after two years; and prevents telephone companies and television stations from owning cable operations in their communities.(4)

The Act lets stand the California cable statute for the two year period until total deregulation occurs. The California Cable Television Development Act of 1982 among other things, provides for rate deregulation and community service channels.(5)

The legislation described above does not remove regulation in the area of two-way interactive cable. Voice and data transmission services will continue to be regulated by the FCC and State utility authorities.(6) In California, this two-way service, if offered by a cable company, will be regulated by the Public Utilities Commission (P.U.C.). At this point, the role of the P.U.C. is not completely clear. It will be necessary to monitor the situation closely through legislation and contacts in Sacramento.

In order to compete cable operators are continually developing more sophisticated systems to meet the demands of the market. These systems often include two-way interactive cable, institutional loops for business and the public sector, and connection with other cable systems in the same area. Despite these advances, 98% of all cable systems are still one-way transmission.(7)

Cable is a transmission medium which can accommodate three types of data - audio, video, and text. Early digital transmission was made possible through teletext technology. Teletext allows for one-way signal transmission. Information is stored in a digital form (on "pages") and broadcast over the vertical blanking interval (VBI - the blanks between the frames on television) on commercial television, and on AM or FM radio frequencies. To read these continuously broadcast teletext pages, television sets are equipped with decoders.(8)

The first teletext systems were developed in Great Britain in the 1970's. The British Broadcasting Corp. (BBC) developed "Ceefax", and the Independent Broadcasting Authority (IBA) developed the "Oracle". Systems in many European countries were designed following the British standards. Many teletext trials are underway in the United States. Libraries have not been involved in these trials, probably as a result of the limited storage capabilities of teletext.(9)

Videotext is the two-way transfer of information over a communications medium. This type of interactive computerized system can be accessed over telephone lines or two-way cable. Capabilities of videotext include information retrieval, transactions, communications, computing, and telemonitoring.

The British also led the way in the development of Prestel, the first videotext system in 1974. Designed by Sam Fedida (considered the inventor of videotext, or viewdata), the Prestel system is now owned by British Telecom. Other videotext systems have been developed by the French (Teletel), Canadians (Telidon), and Japanese (Captain). Some U.S. experiments have included Viewtron, the Knight-Ridder/AT&T project in Coral Gables, FL, and the Times Mirror project in Mission Viejo, CA., and Palos Verdes, CA.(10)

The first operational videotext system in the United States was the QUBE project in Columbus, Ohio. This Warner Amex Cable Communications project began in 1978 and offered its subscribers a wide variety of services. In addition to extensive offerings of pay-per-view first-run films, and special events in music, sports, theatre,and local programming, QUBE developed programming which involved audience response. One of the benefits to QUBE has been this free source of data for program development.

In 1980, Warner Amex Security Systems (in Columbus) provided central monitoring for burglar, fire, and emergency medical alarms by coaxial cable and phone lines. The unfortunate result of increased access to police and fire services has been a surge in the number of false alarms.(11) The interactive service of QUBE as well as a number of other two-way services, has since been discontinued due to lack of sufficient user base.(12)

Another videotext service was also tested on the QUBE system. Microcomputers were linked via cable to CompuServe, an online database located in Columbus. Subscribers to the test study received free Atari microcomputers to access, through CompuServe, banks and stores, as well as newswires, local newspapers, electronic mail, and entertainment services. The project demonstrated that this type of system is technologically possible. Implementation was dependent on microcomputer ownership and cable operator involvement and backing.(13)

Libraries have been involved in all stages of cable development. Limited by technology and by reluctance on the part of many cable operators to proceed with two-way interactive cable, libraries have only in recent years approached the issue of interactive information delivery. Traditional library involvement has been with television programming for specialized audiences, also called narrowcasting. With developments in teletext and videotext technology, libraries along with local television stations have become involved in planning for interactive information delivery over cable.

Successful library involvement with cable is dependent on support from the city administration, telecommunication staff, vendors, library administration and staff as well as from the community. This involvement can take many forms, from the collection and provision of printed resources and establishing video collections, to production of video programming and two-way video reference.

Libraries developing solid collections on cable technology can also serve as repositories of cable franchise proposals. In this role, the library functions as the community information center on the cable issue. Libraries have sponsored workshops and some have taken a role in local franchising. Many libraries provide circulating video collections for their patrons as well as training for the use of video equipment.

Those libraries that have gone beyond collection development with cable have done so with television programming to specialized audiences, providing programs on specific topics telecast from television studios or live from the library. The Atlanta Public Library has a dedicated library channel and a television studio in the library.(14) Another means of involvement at this level is the opportunity for the library to serve as the coordinator of local government access and/or public access channels.(15)

Interactive information delivery is the next step for libraries. Libraries have been involved in many videotext projects. Successful efforts include the London and SouthEastern Library Region (LASER) project with the Prestel system, Maggie's Place at the Pike's Peak Library District, and the Calgary Libraries Trial of the Telidon System. The LASER project involved the coordination of community groups and organizations involved in data input into Britain's Prestel system.(16)

Maggie's Place is the name given to the computerized system at Pikes Peak Library District in Colorado Springs, CO. There are 600 microcomputer owners in the area that access the system via phone lines. These users can browse through the library's catalog, a calendar of events, a file of community organizations, and a file of courses offered in the community.(17)

The Calgary Libraries Trial brought together libraries to construct local data files, to monitor patron response and use, and to suggest additional applications for Telidon and videotext in libraries. Files included 1000 Calgary clubs and organizations, over 500 scheduled events at the sixteen Calgary Public library locations, library books, records and videodiscs, and a general information file. This file contained Canadian lottery winning numbers, federal and local officials, hockey and book quizzes, and city street maps showing library branch locations. Terminals were located at all participating libraries.

Results showed that the system was easy to use, that publicity resulted in high community interest and use, and that project participants need to closely monitor color graphics and textual data for editing and updating. Suggestions for additional library uses of the system included electronic mail, increased consumer and community information, assistance in service to handicapped patrons, literacy programs, and computer-assisted library instruction.(18)

Cable is an attractive option for libraries in providing information to their communities. Innovative service can perhaps gain more rapid acceptance when joined with a familiar medium. This provides libraries with the opportunity to serve a broader audience, and to serve them in their homes and offices.

The Public Library of Columbus and Franklin County took advantage of this opportunity by providing local programming over the QUBE system. Their approach was unique in that it provided the opportunity for audience response to their programs. Several libraries will soon make available online catalogs for their communities via cable. These include the New Orleans (LA), Iowa City (IA), and Lexington (KY) Public Libraries.(19)

The Iowa City (IA) Public Library, one of the first public libraries in the country to provide an online public access catalog, is now one of the first libraries to provide remote access to their catalog via cable television. Terminals with a touch tone device, either a telephone pad or numeric keypad, and decoder are placed at the users end. Terminals are located at the senior citizen center and an alternative high school. The user is shown a truncated 40 character line, listing the record number on the left hand side of the screen and brief author and title information. After selecting the record number, the user is shown the full bibliographic record and shelf status. At this time, it is a view only system. The user cannot request materials via the system.

The cable interface was developed as a cooperative project of the Library, the local cable operator and the computer vendor, CL Systems, Inc. CLSI developed the necessary software which uses an Apple microcomputer to translate the search strategy. A modem on the computer end connects the microcomputer and the cable. The cable company has provided the library access to the institutional network which links the school and senior center.

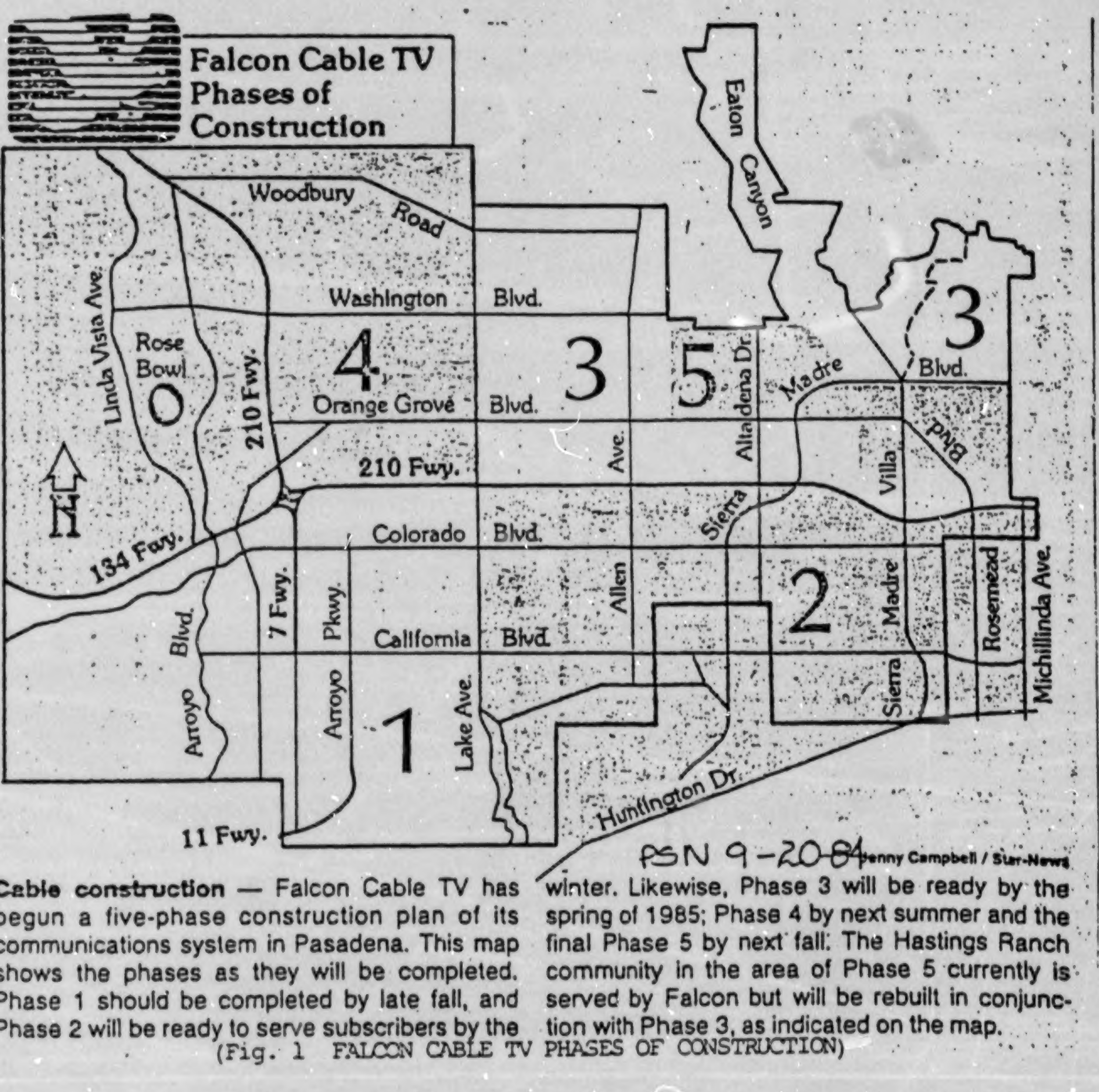
Cable use by libraries should continue to be viewed in broad terms as an attractive information delivery option. Individual cable operators are critical in determining the economic feasibility of two-way interactive cable. Libraries need to develop systems which can be implemented when two-way interactive service becomes available. With increased involvement in cable technology, libraries will be able to expand their services and offer resources not possible before.

The Pasadena Public Library has been involved in the cable process in several ways. Serving as the city repository for local documents, cable proposals and city board meeting minutes have been available for public review. In addition, collection development efforts in the area of cable technology continue. Various City groups and organizations will be involved in television programming over the community access cable channels. As a result, the Library, instead of duplicating this activity, has proceeded with the planning of an interactive computerized system to make online retrieval of local information available for the first time. This plan will help in making the Library ready for implementation when two-way interactive cable becomes a reality in Pasadena.

As a result, it was with great anticipation that the Pasadena Public Library staff awaited the outcome of the cable proposals for the Pasadena franchise. On January 12, 1984, after months of consideration and careful negotiations, the Pasadena Board of City Directors approved a fifteen-year contract giving the City's cable television franchise to Falcon Cable TV.

At that time, Falcon hoped to begin construction in three to six months. The contract specifies that Falcon will construct 237 miles of cable passing 42,000 homes by July, 1985.(20) It will be the first major U.S. installation using 550 MHZ bandwidth. One cable line with 79 channels will be laid.

Falcon now plans a five-phase construction plan for its communications system in Pasadena. Phase 1 will be completed by late Fall, 1984, and will cover the area west of Lake Avenue and south of the 210 Freeway. Phase 2 will bring cable to additional subscribers by winter of 1985, covering the area east of Lake Avenue and between the 210 Freeway and Huntington Drive. The third phase will make Falcon service available to subscribers living east of Lake Avenue and north of the Freeway by spring of 1985. Phase 4 will follow in summer of 1985 to the area west of Lake Avenue and north of the Freeway. Phase 5 will be accomplished with Phase 3 and will cover the Hastings Ranch area which is currently served by Falcon and will be rebuilt. (Fig. 1)


Falcon Cable TV
Phases of
Construction
Woodbury Road
Washington Blvd.
Orange Grove Blvd.
Rose Bowl
Linda Vista Ave.
210 Fwy.
210 Fwy.
134 Fwy.
Colorado Blvd.
California Blvd.
Arroyo Blvd.
7 Fwy.
Arroyo Pkwy.
Lake Ave.
11 Fwy.
Huntington Dr.
Allen Ave.
Altadena Dr.
Sierra Madre Villa
Sierra Madre Blvd.
Eaton Canyon
Rosemead
Michillinda Ave.
Blvd.
N
1
2
3
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PSN 9-20-84

Jenny Campbell / Star-News

Cable construction — Falcon Cable TV has begun a five-phase construction plan of its communications system in Pasadena. This map shows the phases as they will be completed. Phase 1 should be completed by late fall, and Phase 2 will be ready to serve subscribers by the winter. Likewise, Phase 3 will be ready by the spring of 1985; Phase 4 by next summer and the final Phase 5 by next fall. The Hastings Ranch community in the area of Phase 5 currently is served by Falcon but will be rebuilt in conjunction with Phase 3, as indicated on the map.

(Fig. 1 FALCON CABLE TV PHASES OF CONSTRUCTION)

TWO-WAY INTERACTIVE CABLE ACCESS

By 1988, it is anticipated that the cable penetration level nationally will be 60% of all television owning homes, however less than 20% of these cable subscribers will have access to addressable converters necessary for two way interactive transmission, and only a handful will be online.(21). In addition to this 20%, with access to two-way addressable systems, 40% of cable subscribers will have access to one-way addressable systems.

By 1984, the cable penetration nationally was 38% of all television homes, some 30 million subscribers served by 6000 cable systems.(22) Of these homes, 56% subscribed to the basic service, 60% of these subscribed to a pay service, such as a premium movie channel, and approximately 20% purchased two or more services (23). In analyzing the capability of these systems, the majority offer 12-20 channel capacity which are not two-way or addressable systems. According to the May, 1984 Strategic, Inc. publication Two Way Cable: The Key Issues, "...despite all the hype about cable television as a two-way transmission medium, the industry is still overall a one-way provider of video retransmission service." (24)

Beyond the issue of system capability, the practical development of two-way transmission of data via cable is in the embryonic stages. The cable operators are faced with a number of important issues, including Federal Communication Commission and Public Utility Commission regulation, entry of the telephone companies into the cable service arena, costly initial construction, and expensive hardware requirements.

Strategic, Inc. Two Way Cable: The Key Issues comments "...cable operators may miss the opportunity in this area [two-way transmission] if they don't learn the data transmission business by 1985" (25) It is anticipated that there will be significant demand for two-way transmission and institutional network services in urban areas by 1990.

Currently the Bell Operating Companies control 95% of the local data communication market and are moving into the area of cable technology with the installation of broadband fiber optic cables which provide voice, data and video transmission. Telephone companies have a definite advantage over the cable operators, in that they have the ability to cross city boundaries, whereas cable companies are limited by the local franchise; the telephone companies are experienced data carriers and progress in fiber optic cable will move them into the areas of video and high speed data links. Installation "...of fiber optic cables by the [telephone companies] could eclipse the cable industry I-net [institutional network] opportunities dramatically."(26) They further stress that "...cable operators may not have the management infra-structure to adequately manage the risk of competing head to head with the telephone companies in a relatively new service area."(27) With this risk in mind cooperation with the telephone companies by the cable operators may provide mutual benefits.

Telephone companies, including Pacific Bell, are investigating the feasibility of using fiber optic based interconnects to provide broadband interconnection facilities with the cable companies. Proposals call for the leasing of fiber optic plants for use in institution networks (I-nets) constructed by the telephone companies. Pacific Bell intends to market such services via the telephone plants upstream (from the customer) to the cable headend and then the cable plant will provide service downstream via cable to the customer. To support this activity, Pacific Bell proposed construction of a 422 mile fiber optic wideband transmission network with a portion of that network allocated to the local governments, who in turn would lease a portion of the network to the cable franchise. The remaining network would be used by Pacific Bell for voice and data transmission services. This proposal "...angered the cable television industry, but it has also forced cable operators to accept the reality that their strength may be in joint ventures with telephone companies rather than a direct and expensive race to wire urban areas".(28) The cable companies are continuing to oppose the entry of the telephone companies into the cable industry.

Notwithstanding these obstacles, cost may also be a barrier to the entry of the cable operator into the two-way data transmission realm. Strategic, Inc. states that ten years ago the cost to provide a mile of cable was $10,000, today the costs range from $50,000 - $100,000 per mile.(29) In order to recover costs, cable operators are looking for areas with 70 homes per mile. To construct a full dual cable subscriber system the costs can range from $50,000 to $100,000 per mile and can total over $50,000,000 in a major city.(30) With 15 year franchise ordinances, cost recovery is questionable in all but the most densely populated urban areas. Cable companies must turn to alternative sources of revenue, and data transmission is clearly one such option. With the cost of two-way transmission being twice as much as the one-way technology, communities must question the reality of constructing additional two-way transmission systems.

Strategic, Inc. expects that "...by 1990, that 25% of all cable households will be passed by two-way cable, representing 15% of all television households.... This growth will be influenced by several factors ... state and federal regulatory environment, the rate of plant upgrades by local telephone companies to offer broadband services,... and the ... planning and management philosophies of cable operators ...." (31)

Today, the cable companies are either currently offering or proposing to offer a variety of two-way cable services. The Pasadena Falcon Cable TV contract calls for many of the following services:

- -home data services—delivery of videotex, teletext and cabletext
- -downloading services-transferring computer software via cable to home computers
- -transaction services—such as shopping and banking at home
- -pay-per-view—ordering specific programs on a one time view basis
- -home and business security services--replacing existing phone lines linking to police and fire departments
- -energy management
- -traffic signal management--using cable lines to synchronize and control traffic signals
- -remote meter reading

The availability of the above services is market dependent. The most important of these services may be the downloading of data and video to the home subscriber.(32) With the expected ownership rate of microcomputers by 1990 being at the 70% level, and the desirability to download databases and software program computer interconnection, cable delivery of these services should increase the demand for two-way transmission. Although early two-way service experiments including the Columbus, Ohio based Warner Amex QUBE experiment, showed the feasibility of such services, the project was discontinued because subscribers were not willing to pay $25-$50 per month for the interactive capability with such few products available on the system.

The NABU Network test marketed downloading of data in the Ottawa, Ontario Canada area. The Network allows subscribers to use their home computers connected to the cable system to receive programs and data on various subjects. The Network is being expanded into the United States in 1984, with Arlington, Virginia, planning to install a regional computer which will receive update software via satellite.

The computers will be linked by microwave to the cable system headends. The cable operators are able to insert local videotext and data on a local and regional level in addition to the materials that NABU provides. NABU currently leases to subscribers microcomputers manufactured by NABU Manufacturing Corp. and intends the system to be compatible with standard computers in the U.S. "NABU's penetration in Canada exceeded its projection by over 100%, with 70 requests for service received daily."(33)

Several tiers of services are available on the NABU network, with basic service costing $10.00 per month and additional levels of service at $5-$10 per month. The system currently uses phone lines for the return signal from the microcomputer, but plans to expand service to two-way interactive cable service.(34)

In order to receive and transmit data to and from a microcomputer or CRT terminal via cable, the home user must have a modem type device capable of converting digital information strings into signals that can be transmitted over cable. A variety of companies are marketing such devices. EMDA, Inc. reviewed the products offered by SYTEK Corporation (Mountain View, CA), Packet Cable (Cupertino, CA), Jerrold Division of General Instruments (Eatboro, PA), Phasecom Corporation (Los Angeles, CA) and Scientific Atlanta (Atlanta, GA), recommending SYTEK for an initial test because of their interest in undertaking the project and the availability of technical assistance out of their Los Angeles office.

The user of a cable connection to the local database, would need a microcomputer. The SYTEK modem would be attached to the cable, as the cable tuner for the television is attached. The microcomputer is attached to the device through the RS232 connector. By using the microcomputer's dial access software the home user would have access to the PALS database via cable.

The SYTEK system is capable of informing the user if the system is busy, however it currently does not offer queuing capabilities. EMDA, Inc., Falcon and SYTEK are planning to test this type of two-way interactive cable transmission. These tests have been arranged to occur sometime in late November, or early December 1984, and the PALS database will be one of the services that will be tested. If these tests prove successful, it is anticipated that interaction with home users in the Pasadena area who have access to microcomputers, and who wish to add cable modems may be able to access the PALS databases via cable. If the SYTEK test should prove that all parties concerned have mutual benefit in continuing with the plan, those homes or businesses that connect to the cable and that are equipped with microcomputer or CRT terminals may be offered an option of renting or leasing a SYTEK modem device to access the PALS databases.

Although two-way interactive capability is being investigated locally, Falcon is not obligated to provide two-way interactive capability until they can be assured of a "reasonable" rate of return on their investment. The Pasadena Community Access Corporation, a non-profit corporation established as part of the Falcon franchise ordinance, has as one of its goals the demonstration of the applicability of a two-way interactive system. The City has identified several specific city uses of two-way interactive cable networking through a local area network. No specific details of these programs are available, however investigation of the inter-facing and accessing devices is necessary regardless of implementation status.

MODEM AND TELEPHONE LINE ACCESS

There are many cable interface devices in varying stages of development that permit cable subscribers two-way interaction with databases via cable, however, there is no standard established to warrant anything other than experimental evaluation. In the area of microcomputer dial access, a communications protocol has emerged for the transmission of textual information between various computers. This protocol consists principally of the American Standard Code for Information Interchange (ASCII) codes, asynchronous communications, and modems transmitting at rates between 300 and 1200 baud.

Thousands of homes in the Pasadena community are already equipped with some type of microcomputer. Many of them have communications capability using the above protocols. The first goal is the simple interchange of textual information, with persons in the community using cable, low-cost terminals or microcomputers.

In order to use microcomputers to access PALS, modems are necessary to connect to the telephone lines which in turn connect to the computer. Modems are devices that convert the digital information produced by a computer into analog signals that can be transmitted over ordinary telephones in the form of tones. Nine million modems were sold in the U.S. last year, and twelve million are anticipated to be sold this year.(35) Today's lowest cost 300 baud modems are less than $100 while the more sophisticated higher baud devices can be purchased for $400. People who have purchased microcomputers would be able to adapt their systems to communicate with the PALS project.

INTERCITY CABLE CONNECTION

In 1981, the Manhattan Cable Co. joined with the Viacom Cable franchise, located in San Francisco, Tymnet and Local Digital Distributors to conduct a nationwide experiment. Two objectives of this experiment were the comparison and evaluation of various local data network alternatives and the testing of these alternatives in conjunction with intercity satellite links and packet switched networks. This experiment, authorized by the FCC, demonstrated that multiple vendors and multiple technologies could provide end-to-end transmission links without involving traditional telephone companies. This type of data transmission, however, is quite costly and, in order for a cable operator to offer such a network, substantial resources and a large customer basis would be necessary.

Clearly, interconnection of this nature is not necessary between local governments. Other alternatives for linking two cable systems do exist. Pacific Bell is offering a connection with 54 channels called T-1 carrier. This type of service allows for the bridging of two cable systems, taking into consideration the requirements of broadband transmission, while being cost effective. Pacific Bell estimates installation fees of $5,000 and monthly charges of $2,000-$3,000. (36)

Future benefits might be derived from combining the operations of the PALS project with the adjacent City of Glendale. Sammons Communications Inc. holds the cable franchise for the City of Glendale. Discussions are underway with the Glendale Public Library management staff to determine whether such a joint enterprise would be desirable. Discussions with Falcon Cable TV in this regard are also in progress, and estimates for the cost of inter-connecting the Pasadena cable television system with the existing Glendale system are forthcoming.

A substantial amount of study will have to be done on the part of the libraries, cable companies and other city officials. An investigation will determine the extent of the benefits received once the Pasadena system is installed. These benefits will have to be commensurate with the dollars invested. Linking the two adjacent cable systems together with cable connections might be too costly for the benefits derived from meeting the library needs. There may, however, be additional benefits to either the cable company or the city from such an interconnection, which in turn might bring this kind of project into a different focus. Therefore, we will continue to pursue these possibilities.

VI. THE DATABASES: GENERAL CONSIDERATIONS

One of the most important questions the Library's recent Community Analysis project considered was whether all of Pasadena's diverse information needs were being met adequately. If there were unmet needs, then the issue was whether the Library was the appropriate agency to handle these needs and if so, what short- and long-range plans could be developed to accomplish them.

One of the most significant findings of the project was that the Library should be the focal point for providing information about the community, with the Central Library serving as the community information clearinghouse. The branch libraries have specialized knowledge of their service areas, and could function as neighborhood resource centers having rapid access to city-wide information. In general, those interviewed felt that there is a rich variety of organizations and resources in Pasadena but no centralized source to assist people through the complex "maze" of information available. People felt that in order to function effectively in the community, they had to have access to more information about the Pasadena community. However, they often found it difficult to find out what they needed to know to take advantage of the numerous community resources, services and facilities Pasadena has to offer.

These findings have been confirmed by the impressions of the Library staff serving at the public desks. Staff frequently receive requests for information about the community and the various resources available to residents. These requests can be described as the "where can I?" or "where is?" type of requests, as in "where can I get free legal assistance? where can I find statistics about Pasadena for a grant I am writing? where can I learn aerobics? where can I get help with a landlord/tenant problem? where is the Senior Citizen Commission meeting being held?" These types of questions are certainly not new and the Library has always provided this type of service. However, the changing demographic make-up of the Pasadena area, the increased diversity of its population, and the Pasadena Public Library's commitment to serve the information needs of all citizens have all made the provision of local information a top priority. Community information has become an integral part of the Library's responsibility to serve the total information needs of the public.

Library staff frequently are asked questions that cannot be answered from traditional library resources. In order to respond to the kinds of questions people are asking, the Library has, over the years, developed a number of in-house files containing information about the community. These files are outlined more fully in the detailed descriptions of each database, but at the present time they exist in a variety of formats. Some information exists in pamphlet files and some in card files. Some of the information has been published and is presently available to the community in a print format.

Regardless of format, manually created and maintained files are fraught with problems. They are expensive because of the amount of staff time required to establish and update them. Secondly, this directory type of information is difficult to keep up-to-date because names of contact people, hours of operation or programs, addresses and phone numbers, change so frequently. Thirdly, these files tend to be inflexible because they can usually only be accessed by one, or at most two, different index terms. Finally, these files are only available to Library staff in one location and users must either call or visit the Library to obtain information.

Online technology has greatly improved the Library's ability to collect, organize, retrieve, disseminate and update information that matches the needs of the users with the resources in the community. The potential types of subjects locally created online databases could cover are numerous. The decision as to which databases to make available first was based on the findings of the Community Analysis Report coupled with recommendations from Library staff based on the types and numbers of requests received from the public. The justification for the inclusion of each of the six databases follows:

1. Decision Makers:

In order to function effectively in our society, citizens must have an understanding of and access to the political process. Citizen participation in this process depends upon citizens' knowledge of how, when and where they can participate. For many years, the League of Women Voters and the Pasadena Public Library have published Decision Makers, which is a description of City government and lists elected and appointed office holders. This database is designed to enable people in the community to determine the officials making decisions affecting the community.

2. Statistics:

Over 225,000 reference questions are asked annually at the Central Library and many of these are requests for statistical data concerning the Pasadena area. In addition, many of those interviewed as part of the Community Analysis project expressed a need for rapid access to statistics about Pasadena. Local businesses need such statistics as the number and kind of businesses licensed annually, the number of employees in Pasadena and demographic characteristics of the labor force. Social service agencies require statistics in order to prepare grant proposals and plan services. Local government and school department offices generate and require statistics for varied activities. At the present time this information is dispersed among the various City departments and organizations responsible for collecting it. Although the Library has some information of this type, there has been no organized effort to make this data widely accessible to the public. The Library should act as the prime agent for centralizing, consolidating and disseminating statistical data about Pasadena.

3. Community calendar:

Pasadena can be characterized as a community with a high level of citizen involvement, evidenced by its many religious, social, hobby, recreation, civic, service and neighborhood organizations. Presently the Pasadena Arts Council publishes a monthly calendar of art and cultural events but there is no comprehensive community calendar that covers activities of all the groups and organizations in the community. The Library is frequently asked for "What's going on?" type of information, yet it does not always have the resources to answer these questions. Developing and maintaining an online community calendar of events fills a gap in information services to the community. This type of database will likely benefit a great many people in the community by assisting the hundreds of groups, agencies and organizations in the community. The database will provide a single focal point through which the library can reach many people. In addition, it is likely to attract new residents of the community since it will provide a great introduction to the many activities and opportunities available in the community.

4. Business:

Although facts and figures for many large, publicly held companies can be found in a variety of sources, this same information for local, private companies is very difficult to obtain. Yet, it is frequently requested by those looking for jobs or those shopping for goods and services in the community. In the model database that has been developed for this project, the information included is limited to typical directory type of information such as company officers, products, size and sales volume and other similar information. Although this information is extremely useful in itself, we plan to expand this database to include a classified jobline where companies could list their current employment opportunities and where those seeking employment could list their skills. This database will likely be used by many who do not use traditional library resources, including low income persons and the unemployed.

5. Community Organizations

Many of the local organizations and social service agencies interviewed during the Community Analysis process felt that one of the most useful services the Library could provide would be to create a computerized community resource databank, consisting of a current directory of local organizations and agencies with descriptive information regarding services offered. Several print sources exist, such as the CRIB directory, but are incomplete and frequently out-of-date. So as not to duplicate existing services, the Library staff is investigating all resources in the community that serve to direct people to organizations or agencies that can satisfy their needs. Hardcopy publications and any existing machine-readable data will be examined and possibly incorporated into the PALS project.

6. Access to the library's existing database of books, periodicals, and audiovisual materials:

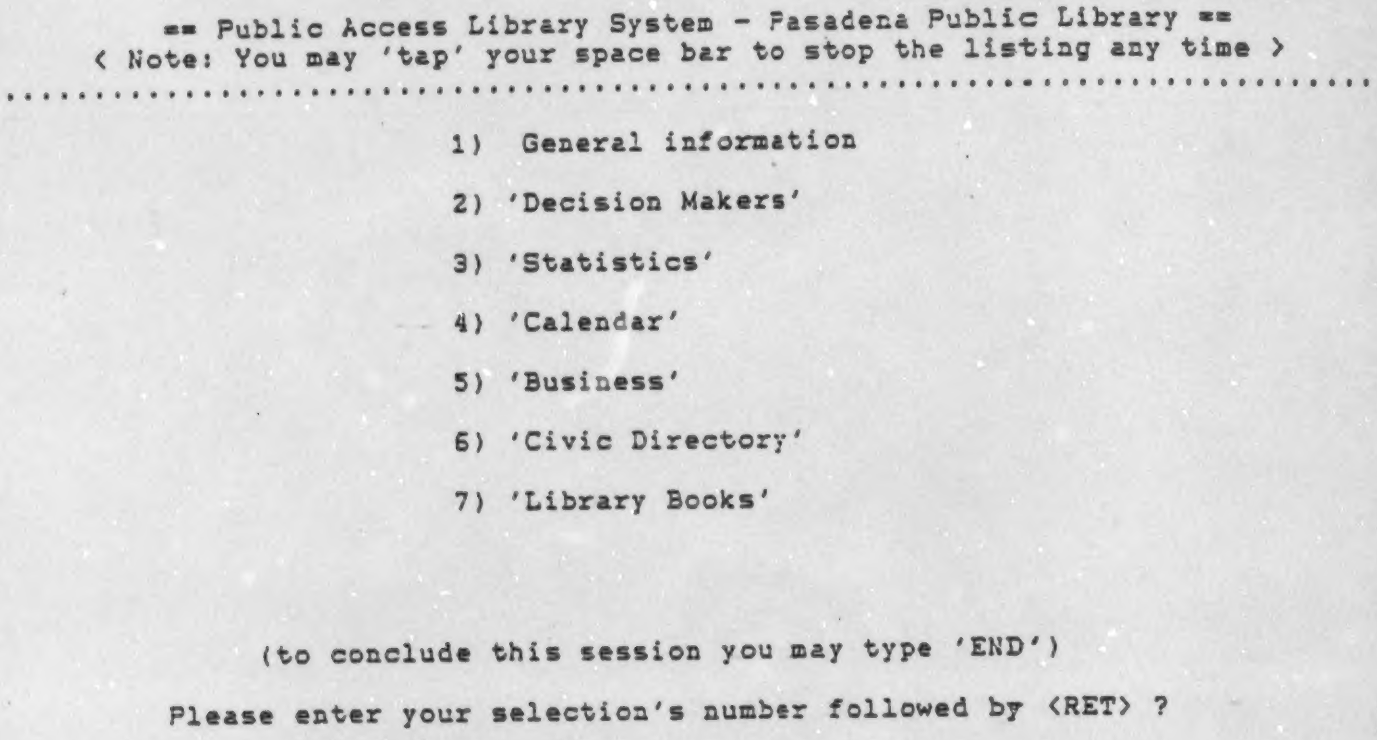
The foundation of the Library's GEAC automated circulation system, shared with the Glendale Public Library, is a single database, consisting of the books, records and other materials from both libraries. At the present time, this database contains approximately 370,000 titles and two million items and is available for staff use only at library facilities in Glendale and Pasadena. An online public catalog is planned for 1985.

The Pasadena Public Library enjoys an excellent reputation in the community and has a high number of active users. A citizen's survey conducted in June, 1982 found that individuals from at least three of every four Pasadena households (76.2%) had visited the Pasadena Public Library during the past year. Although the number of households that do not use the Library is small (22.1%), several responses indicate that the ability to access the Library's holdings from home would increase usage of Library resources. For example, 25.6% of those who do not use the Library do not because of lack of time, 9.1% found parking inconvenient, 6.1% felt that the location was inconvenient and 4.7% felt the hours were inconvenient. Perhaps the single most important step the Library can take to achieve one of the major recommendations of the Community Analysis project, that of increasing access to library resources through the encouragement of self-help, is to make the database of library materials available to users at home.

MODEL DATABASE

In order to facilitate planning of an interactive information delivery system, a model database was designed and a limited number of records were entered. This model provided a starting point for discussion and development.

A main menu (Fig. 2) provides seven choices. First is General Information which describes the system and gives searching methodology and Library policies. Following this are Decision Makers, Statistics, Calendar, Business, Civic Directory (referred to as Community Organizations in this report), and Library Books.

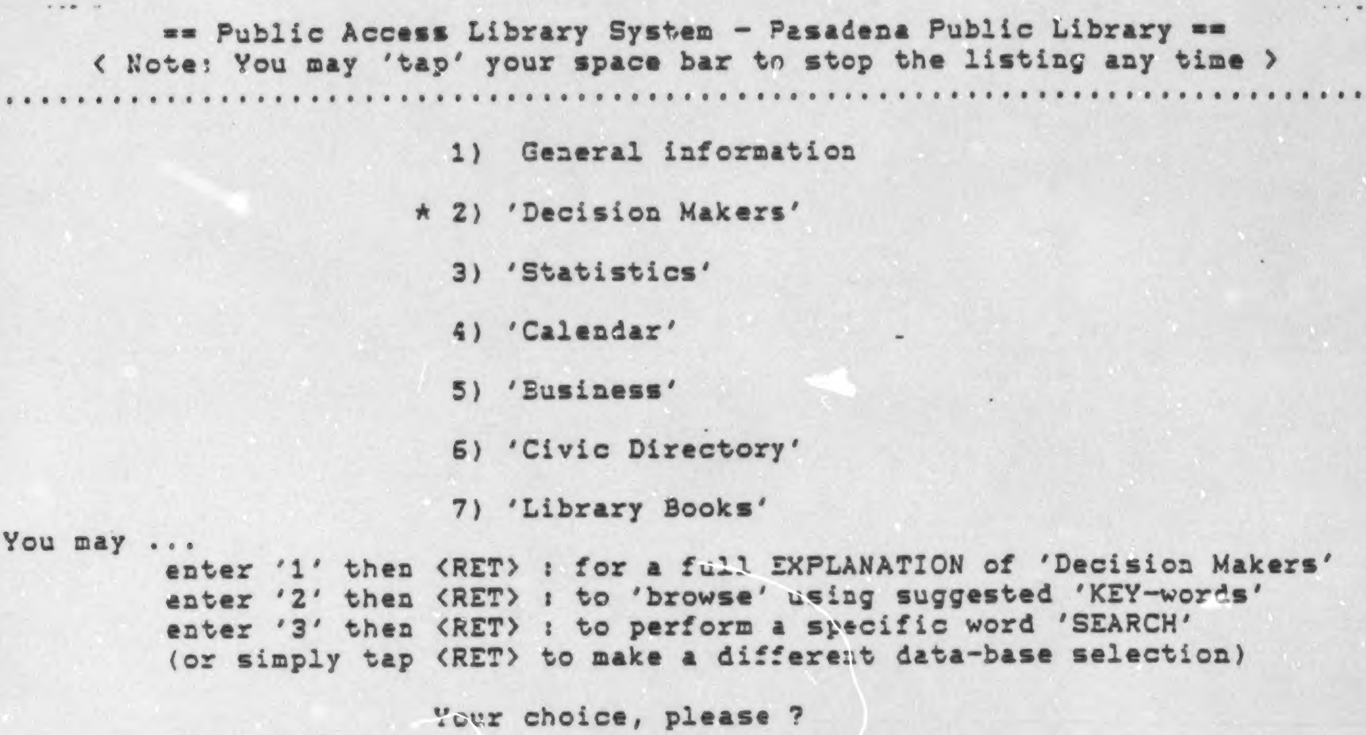


```
       == Public Access Library System - Pasadena Public Library ==
     < Note: You may 'tap' your space bar to stop the listing any time >
..............................................................................

                        1)  General information

                        2) 'Decision Makers'

                        3) 'Statistics'

                        4) 'Calendar'

                        5) 'Business'

                        6) 'Civic Directory'

                        7) 'Library Books'


               (to conclude this session you may type 'END')

          Please enter your selection's number followed by <RET> ?
```

(Fig. 2 Main Menu)

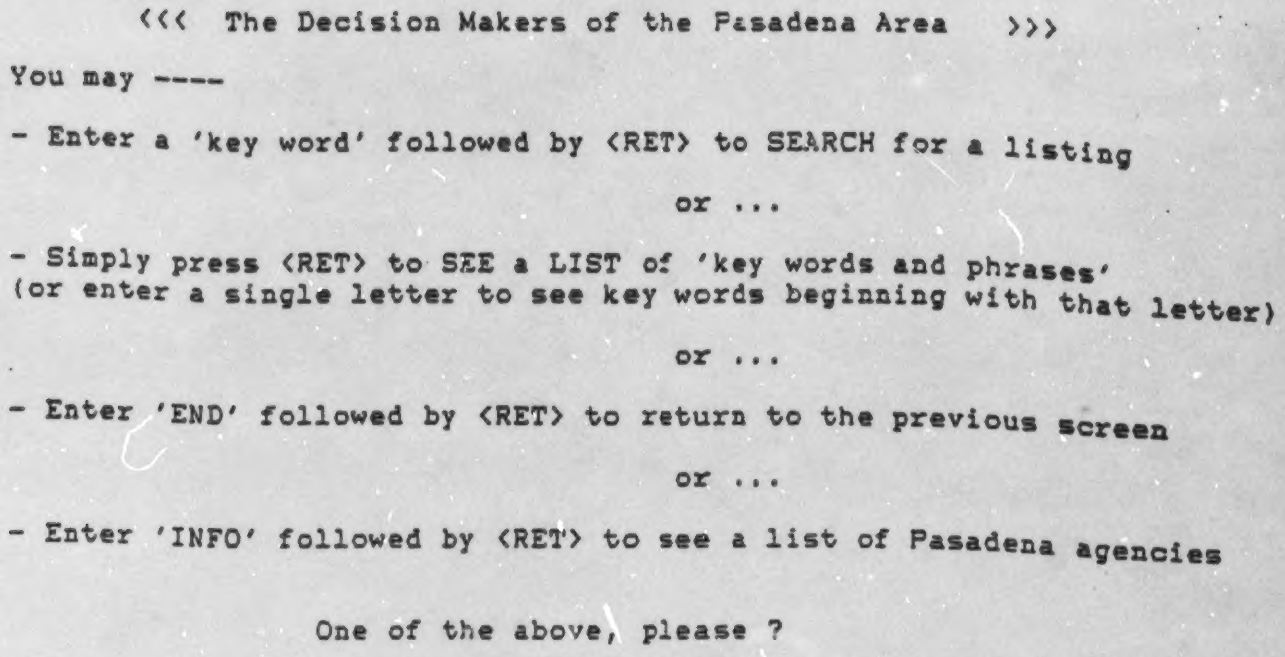
Each of the databases have some similarities in content, format, and searching capabilities. A welcome screen in each database contains a description of the scope and content, audience, sources of information, special searching tips, and policy statements. Record format is the same for each database (see software section and database description section for more specific record information).

The search methodology is similar for each of the databases as well. Two search methods are provided: a browsing approach and a specific search. After selecting a database to search, the user will be prompted with four options at the bottom of the screen as shown in the Decision Makers database (Fig. 3 & 4). The user can choose: 1) to retrieve more information; 2) to perform a browsing search of keywords; or 3) to perform a specific search. The fourth option allows the user to return to the original menu screen and begin again.



```
     == Public Access Library System - Pasadena Public Library ==
   < Note: You may 'tap' your space bar to stop the listing any time >
.............................................................................

                         1)  General information

                       * 2) 'Decision Makers'

                         3) 'Statistics'

                         4) 'Calendar'

                         5) 'Business'

                         6) 'Civic Directory'

                         7) 'Library Books'
You may ...
        enter '1' then <RET> : for a full EXPLANATION of 'Decision Makers'
        enter '2' then <RET> : to 'browse' using suggested 'KEY-words'
        enter '3' then <RET> : to perform a specific word 'SEARCH'
        (or simply tap <RET> to make a different data-base selection)

                        Your choice, please ?
```

(Fig. 3 Search Options on Main Menu)

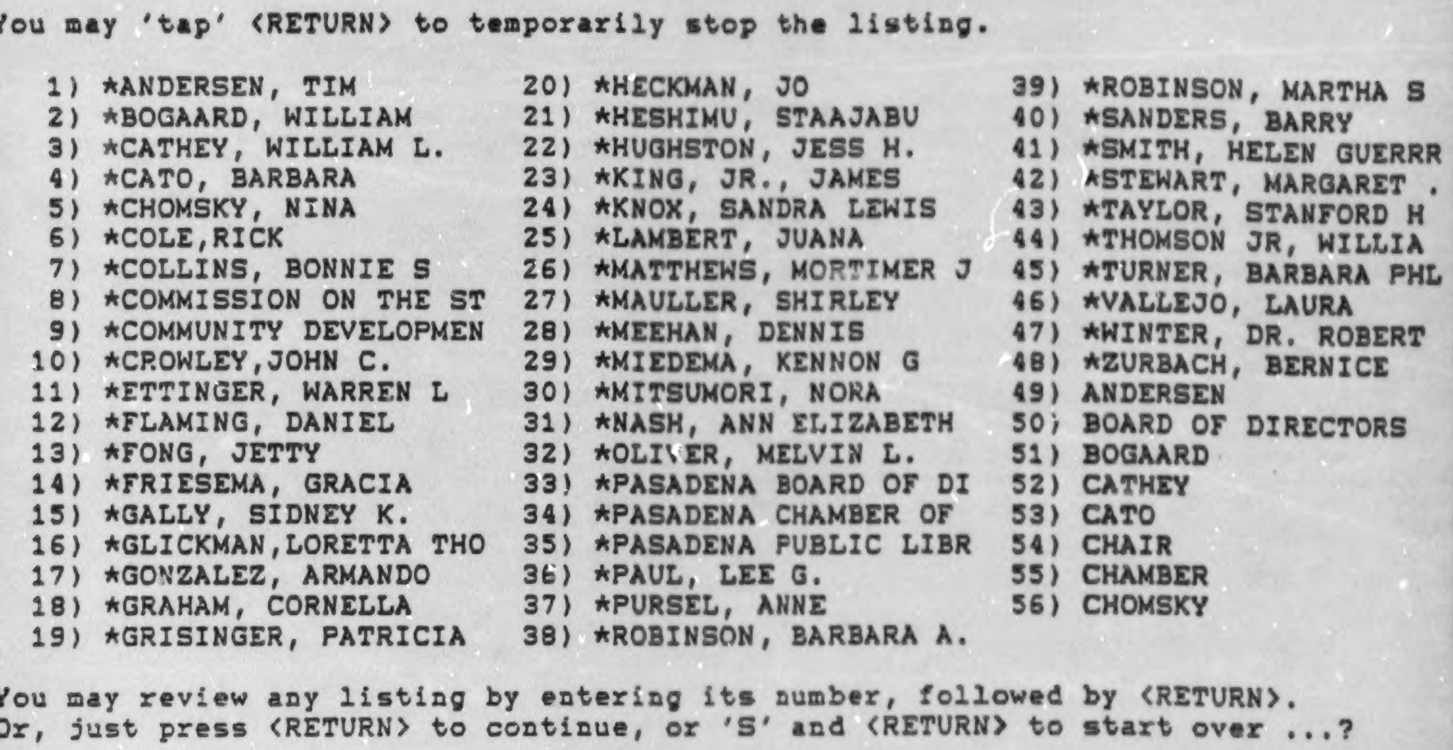


```
        <<<  The Decision Makers of the Pasadena Area    >>>
You may ----

- Enter a 'key word' followed by <RET> to SEARCH for a listing

                                      or ...

- Simply press <RET> to SEE a LIST of 'key words and phrases'
(or enter a single letter to see key words beginning with that letter)

                                      or ...

- Enter 'END' followed by <RET> to return to the previous screen

                                      or ...

- Enter 'INFO' followed by <RET> to see a list of Pasadena agencies

                    One of the above, please ?
```

(Fig. 4 Search Options Screen on Decision Makers Database)

The first choice displays the welcome screen described above. In addition to learning about the sources of data, users will be informed about how records will be updated. While the user can find general searching methods described in the General Information section of the main menu, the user may find specific tips for searching individual databases here.

If the user chooses the second option, browsing by keyword (Fig. 5), he/she can see a list (thesaurus) of terms used as keywords. Choosing one of these keywords will bring to the screen the records with which it is associated. The other method of retrieving that individual record is by a specific search (option three). The specific search allows the entry of up to nine terms. Records will be retrieved that contain the terms listed, much like the "and" strategy of the boolean search logic. As a result of working with the model database we discovered that it is necessary to design the system so the user does not get too many hits or erroneous hits. The system should also allow the user to move from a record in one database directly to a record in another without reentering the main menu. The fourth option is chosen when a different database is desired.



```
ou may 'tap' <RETURN> to temporarily stop the listing.

  1) *ANDERSEN, TIM            20) *HECKMAN, JO             39) *ROBINSON, MARTHA S
  2) *BOGAARD, WILLIAM         21) *HESHIMU, STAAJABU       40) *SANDERS, BARRY
  3) *CATHEY, WILLIAM L.       22) *HUGHSTON, JESS H.       41) *SMITH, HELEN GUERRR
  4) *CATO, BARBARA            23) *KING, JR., JAMES        42) *STEWART, MARGARET .
  5) *CHOMSKY, NINA            24) *KNOX, SANDRA LEWIS      43) *TAYLOR, STANFORD H
  6) *COLE,RICK                25) *LAMBERT, JUANA          44) *THOMSON JR, WILLIA
  7) *COLLINS, BONNIE S        26) *MATTHEWS, MORTIMER J    45) *TURNER, BARBARA PHL
  8) *COMMISSION ON THE ST     27) *MAULLER, SHIRLEY        46) *VALLEJO, LAURA
  9) *COMMUNITY DEVELOPMEN     28) *MEEHAN, DENNIS          47) *WINTER, DR. ROBERT
 10) *CROWLEY,JOHN C.          29) *MIEDEMA, KENNON G       48) *ZURBACH, BERNICE
 11) *ETTINGER, WARREN L       30) *MITSUMORI, NORA         49) ANDERSEN
 12) *FLAMING, DANIEL          31) *NASH, ANN ELIZABETH     50) BOARD OF DIRECTORS
 13) *FONG, JETTY              32) *OLIVER, MELVIN L.       51) BOGAARD
 14) *FRIESEMA, GRACIA         33) *PASADENA BOARD OF DI    52) CATHEY
 15) *GALLY, SIDNEY K.         34) *PASADENA CHAMBER OF     53) CATO
 16) *GLICKMAN,LORETTA THO     35) *PASADENA PUBLIC LIBR    54) CHAIR
 17) *GONZALEZ, ARMANDO        36) *PAUL, LEE G.            55) CHAMBER
 18) *GRAHAM, CORNELLA         37) *PURSEL, ANNE            56) CHOMSKY
 19) *GRISINGER, PATRICIA      38) *ROBINSON, BARBARA A.

ou may review any listing by entering its number, followed by <RETURN>.
r, just press <RETURN> to continue, or 'S' and <RETURN> to start over ...?
```

(Fig. 5 Decision Makers Keyword Listing)

The goal in creating, updating, and maintaining the databases is to make the process as simple as possible and to involve community groups and city agencies. Adding new records is accomplished easily. Data entry design must include the ability to call up old records by name in addition to record number, as well as greater ease in record deletion. This enhancement will facilitate the editing process. Many individuals and groups have seen a demonstration of the model system and have expressed interest and support. Cooperative arrangements may be developed between the Library and these groups for data entry and updating. Two such groups are the League of Women Voters, which has published Decision Makers in print form each year, and the Pasadena Arts Council, which prints a monthly calendar of events. Organizations in the community will be able to enter and update records either on the Library's terminal or through remote terminals. The Library will act as the editor and clearinghouse for these entries, assuring integrity and accuracy. In this way the Library has an increasing role in coordinating local information and in working closely with community groups and city agencies to make that information more readily available.

ISSUES

Initial discussions about the system we wanted to create raised questions about the issues of privacy, freedom of access, accuracy, copyright, and data ownership. If the Library put together such a system, who would own the information? What should be done about downloading? Should mailing lists be encouraged or even printed by the Library for a fee? What copyright implications would be involved?

Database development is new enough that these issues have not yet been resolved. It is difficult to find much information in the literature on the subject of copyright and local database development. However, one area of concern is well documented, the issue of privacy. The privacy issue stems from the fear that existing computerized banks of information about individuals will be exploited by business and government. In 1974 the Privacy Act and the Freedom of Information Act were passed to ensure privacy for the individual.

The Privacy Act limits the types and uses of information which governmental agencies may collect about individuals and provides the right of the individual to have access to such information and to correct it.(37) The Freedom of Information Act further safe-guards this right of access to records kept on individuals.(38) Other laws were passed at the same time in an attempt to make government more accountable to the people.

Critical to this issue is the understanding that this information gathering about people is confidential. It is not collected with the intent of making it available to the public. These laws provide access to those confidential records which were not available before to the individuals in question. As a result, agencies involved in this confidential information gathering must make information about an individual available upon that person's request.

The intent with PALS is to make available information about Pasadena businesses, organizations, and individuals already in the public arena. We are not attempting, nor do we have any need or desire, to collect confidential information such as the type described above. The information which will be made available online is already available in some type of printed form. The Library will function as an editor to ensure that data is appropriately accurate and up-to-date.

There are at least three potential dangers to privacy: access by people who do not need that access, inaccurate or incomplete information, and use of the system for other than its intended purpose.(39) The first area refers to personal records kept on individuals and does not apply to this database. Inappropriate access in terms of data entry will be resolved by the security system built into the software. This will prevent tampering with the system or the entry of data by unauthorized people.

Inaccuracies can occur at the data collection stage and at the data entry stage. Accuracy will be a prime consideration in data collection. The mailing planned each year for verification and updating purposes will be one way to ensure accuracy. Organizations involved in data entry will have a greater interest in making sure that records are accurate and up to date. With the Library acting as a final system editor to prevent misspellings and incomplete records, the database should remain relatively clean. Another means of catching potential errors will be the input from those organizations and individuals using the system.

Use of the system for other than its intended purpose violates copyright. Information ownership has always been a difficult area. What people own is the representation of information in some form.(40) Copyright protects that material form, but not the ideas or concepts contained within.(41)

Laws regarding copyright and patents were not devised with computerized systems in mind. As a result, new developments in copyright law as it applies to databases must be followed one case at a time.(42) Most databases are considered compilations because change has not been made in the information which has been compiled (pre-existing works selected, arranged, and organized). Compilations are copyrightable as original works even though they represent a collection of works. Derivative works take works of others and revise or rework them. If the pre-existing works were in the public domain, there would be no infringement.(43)

In 1980, the U.S. Congress passed the Computer Software Copyright Act. It encompassed many of the recommendations of the National Commission on New Technological Uses of Copyrighted Works (CONTU). The main focus of the act is copyright for software programs, not for the data in machine readable form.(44)

The producers of online reference databases accessed through systems such as DIALOG have clear restrictions regarding use. These usually include the printing of the copyright statement at the beginning and end of each search, and that there will be no alteration or electronic storage of search results (downloading).(45)

Local database development differs from traditional online reference databases in two ways: content and cost. The content of these databases changes as new material is indexed. Once that material is added, however, it will not be changed. The form remains constant and so can be more easily copyrighted. In a database of local information, the nature of the material is that for it to be useful, it must continually be updated. Copyright of such ephemeral systems is not yet resolved.

One way that database producers limit the possible exploitation of their information is through a fee structure. This method is true of online reference databases and of commercially built videotext systems. Charging for access to community information is a question for the public library to resolve. The Pasadena Public Library is committed to the right of people to freely access information. As a result, we have to allow the material in our databases to be used without a charge.

This presents a possible liability for the Library. If the information obtained from a Library database is used in a form other than that in which it originated to the harm of someone else, the Library should not be held liable. The opportunity for people to create mailing lists is recognized and this is not a problem we anticipate. The Library will continue to seek legal counsel as to our responsibilities and copyright privileges.

In working with the model database, the staff realized that it would be necessary to establish data entry standards, in order to assure consistency in forms of personal and corporate names, keywords, addresses, etc. We were presented with questions regarding abbreviations, completeness of names, direct versus indirect entry of names, and so on. Determining the authority for names will be necessary to assure ease in retrieval. If no official authority can be located, criteria will have to be established to create a local authority file. It is possible to use standard library rules for creation of names, such as the ANGLO-AMERICAN CATALOGING RULES, second edition, or a locally developed set of standards such as the criteria established by the Urbana (IL) Free Library for their list of local government agencies

Authorities are also needed in areas of abbreviations and addresses. The Library can select one of the major dictionaries, which contains an extensive list of abbreviations, such as the AMERICAN HERITAGE DICTIONARY and for addresses, the NATIONAL ZIP CODE DIRECTORY is an excellent source of information for mailing abbreviations.

The final critical area for standardization is in the selection and assignment of keywords. A variety of options present themselves for the assignment of subject headings, including the standard library lists--SEARS and LIBRARY OF CONGRESS SUBJECT HEADINGS, periodical indexes and subject bibliographies. The selection of a list will largely depend on the complexity of the subject matter and may vary with each database. Creation of a thesaurus may be necessary if we are to successfully utilize community members to update and maintain the files. Clearly the Library will have to carefully review each record for compliance with whatever standards are established.

VII. DATABASE DESCRIPTIONS

Decision Makers:

The Decision Makers database is a file containing lists of members and meeting dates for local governments, boards, committees, and commissions. The database is designed to enable people in the community to determine which elected and appointed officials make decisions regarding all areas of public concern in Pasadena.

This resource is currently published in print form by the League of Women Voters and distributed by the Pasadena Public Library. It provides information on access to City administrators, directors, and departments as well as federal, state and county officials. An additional resource in the building of this database will be a Library publication Your Officials, which lists the names and addresses of U.S. and California senators and representatives for the districts comprising the Pasadena area. Various local officials would also be listed.

Records can be divided into two types: 1) board, agency, or commission, and 2) individual. Those of the first type include name of the organization, address, phone number, meeting place, frequency, time, chairperson, staff member, and keywords. Individual records also include name, address, and phone number, as well as the board on which the individual serves, term expiration date and keywords.

The League of Women Voters currently keeps the print version updated for its publication each year. It is hoped that a cooperative arrangement with the League of Women Voters will be possible for the updating of the database.

By following the search methodology described above, access is provided to Decision Makers records. The user can browse by keyword or retrieve a record by a specific search term. By typing in the word "mayor", the user will be able to retrieve the record for Pasadena mayor, William Bogaard. (Fig. 6) Another possibility is to browse through a list of Pasadena commissions, boards, and agencies. By choosing the number of the commission desired, the user will be able to retrieve more information about a specific group. (Fig. 7)

```
'Detail info for listing 'MAYOR' ( 1  listings)
                         (*PALS Ref No. 8 )
 Name (org or pers) : BOGAARD, WILLIAM
         Street Add : 331 CONGRESS PLACE
         Rm or Box # :
               City : PASADENA/91105
                Zip : 799-9819 (H), (213)614-2143 (W)
             Phones :
                    :
                      MEMBER OF PASADENA BOARD OF DIRECTORS
                      CHAIR (MAYOR) OF BOARD OF DIRECTORS

                      FIELD REPRESENTATIVE - NANCY ESBENSHADE
                      799-6237


                      CITY COUNCIL~BOARD OF DIRECTORS~
                      PASADENA BOARD OF DIRECTORS~BOGAARD~ESBENSHADE~
                      TERM EXP 87 MAY~
                      CHAIR~MAYOR~


Enter 'S' and <RET> to start again ... or plain <RET> to continue search ?
```

(Fig. 6 Decision Makers Entry)

```
        <<<  The DECISION MAKERS of PASADENA  (page 1)  >>>

      Note: You may 'tap' your space bar to stop the 'menu' listings . . .

        (1) Pasadena Bd of Dir's              (16) Old Pas Parking Adv Comm
        (2) Chamber of Commerce               (17) Parks/Rec Commissions
        (3) Blue Rib Comm/Gvt Effi'ncy        (18) Pasadena Playhouse Inc
        (4) Comm on Status of Women           (19) Planning Commission
        (5) Community Dev Committee           (20) Task Force Pub Facilities
        (6) Conference Center Corp            (21) Resource Allocation Comm
        (7) Cultural Heritage Comm            (22) S Lake Parking Comm
        (8) Design Committee                  (23) S Lake Steering Comm
        (9) Fire/Police Retirem't Bd          (24) Substructure Comm
       (10) Housing Adv and Appeals           (25) Task Force/Crime Control
       (11) Housing Authority                 (26) Task Force/Dev'mnt Mitigation
       (12) Housing Mediation Bd              (27) Pas Olympic Coord'g Comm
       (13) Human Relations Comm (HRC)        (28) Urban Design Adv Comm
       (14) Interim Design Rev Comm           (29) Utility Adv Comm
       (15) Library Board                     (30) Brbnk-Glnd-Pas Airport Auth

              (to conclude this session you may type 'END')

To see a description of a listing, enter its number, then press <RET> ?
```

(Fig. 7 Decision Makers List of Commissions)

Staff involvement in Decision Makers consisted of steering committee discussions, as well as meetings between staff members and the consultant. Staff members entered sample data from the Decision Makers. One of the benefits of directly entering the data was that staff was able to become familiar with the format, recognize problem areas, and suggest modifications. One of the modifications was the inclusion of the specific search directly from the first menu for the more experienced user. In addition, the need for standard formats for names, phone numbers and data arrangement on the screen was identified.

Continued data entry and use demonstrated the need for greater precision in the assignment of keywords. Including as a keyword the name of the board or commission on which a person served record resulted in the retrieval of false hits when the board name was used in a specific search. Awareness of these types of problems allows for refinements to be made in both the software and the data entry process.

The Library anticipate heavy use of Decision Makers by City agencies and departments. It will allow the Library to better serve the community by providing information which is constantly updated.

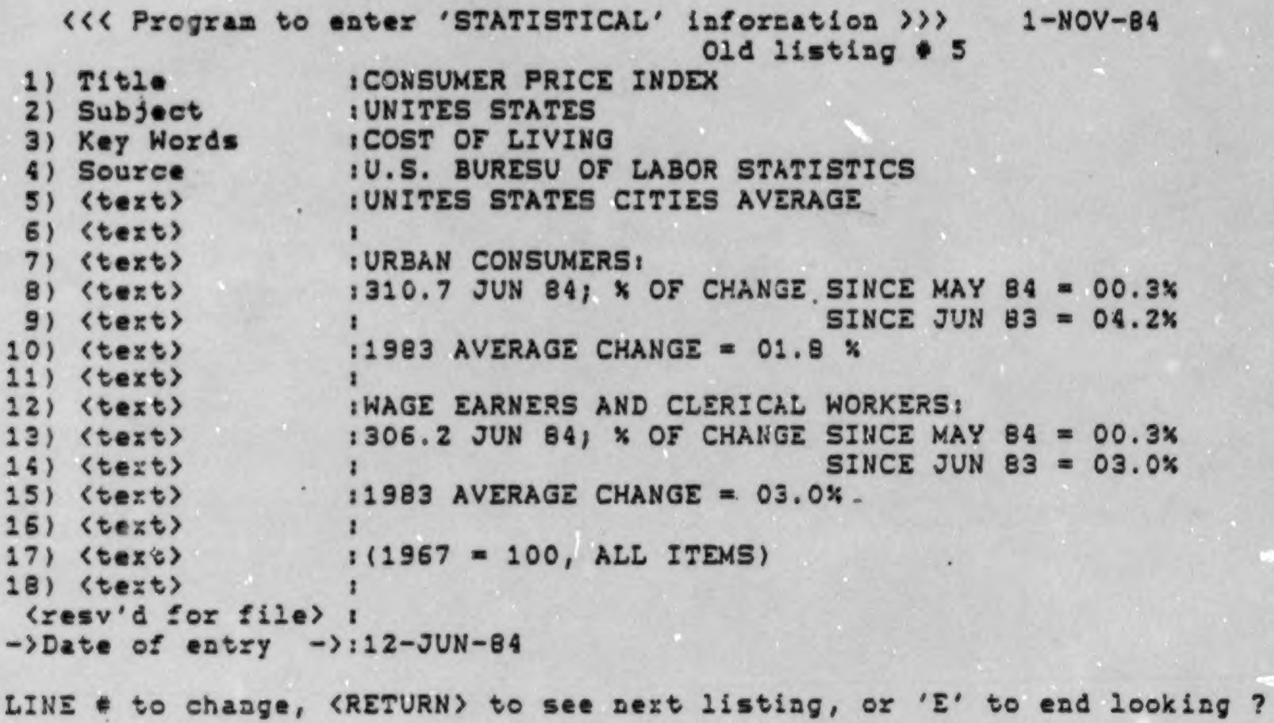
STATISTICS:

As the name implies, this is a database of local statistics relating to population, education, crime, housing, employment and unemployment, and health. The purpose of this database is to bring together in one centralized location the various statistics generated by government, businesses, educational institutions and social service agencies that are of interest to Pasadena residents. This database would supplement and bridge the time gap between the decennial census by furnishing more up-to-date figures.

The results of the Community Analysis project indicated a high level of interest in having the Library act as the prime agent for centralizing, consolidating, and disseminating statistical data about Pasadena. Organizations that might use such data include the Pasadena Chamber of Commerce, Pasadena Unified School District, Pasadena City College, local offices of the California Department of Social Services, as well as several departments of the City, including Police, Health, and Planning

The primary sources of these statistics include all of the above groups, which generate as well as use statistics, but include additional statistics from business licenses, neighborhood organizations, special censuses, market surveys, specialized demographic studies, government publications and local newspapers. Local organizations and institutions will be surveyed during an exploratory stage in order to further investigate what statistics exist, how they are used and how accessible they are. During this phase demographic and other statistical data will be evaluated, sources for obtaining this information will be identified, and statistics that are already existing will be compiled. The Pasadena Public Library presently maintains an inhouse card file which in some cases actually contains statistical data and in other cases refers to print and non-print sources.

The statistics database differs from the other databases in several ways. It is the most flexible of all of the databases. All of the records in this database have certain fields in common, including: title, subject, keywords and source. Beyond this, however, the amount of additional information contained in the record is quite varied. (Fig. 8) Unlike the other databases, the statistics file will also contain historical data; as new statistics are entered, existing data may be retained. The responsibility for entering and updating the statistics in this database will rest with the Library; however, local institutions and organizations will be encouraged to contribute to the database and the Library will seek out statistical information available in machine readable form from other sources.



```
     <<< Program to enter 'STATISTICAL' information >>>     1-NOV-84
                                            Old listing # 5
  1) Title            :CONSUMER PRICE INDEX
  2) Subject          :UNITES STATES
  3) Key Words        :COST OF LIVING
  4) Source           :U.S. BURESU OF LABOR STATISTICS
  5) <text>           :UNITES STATES CITIES AVERAGE
  6) <text>           :
  7) <text>           :URBAN CONSUMERS:
  8) <text>           :310.7 JUN 84; % OF CHANGE SINCE MAY 84 = 00.3%
  9) <text>           :                          SINCE JUN 83 = 04.2%
 10) <text>           :1983 AVERAGE CHANGE = 01.8 %
 11) <text>           :
 12) <text>           :WAGE EARNERS AND CLERICAL WORKERS:
 13) <text>           :306.2 JUN 84; % OF CHANGE SINCE MAY 84 = 00.3%
 14) <text>           :                          SINCE JUN 83 = 03.0%
 15) <text>           :1983 AVERAGE CHANGE = 03.0%
 16) <text>           :
 17) <text>           :(1967 = 100, ALL ITEMS)
 18) <text>           :
  <resv'd for file>   :
 ->Date of entry   ->:12-JUN-84

 LINE # to change, <RETURN> to see next listing, or 'E' to end looking ?
```

(Fig. 8 Statistics Entry)

Due to the unique nature of this database, the staff committee involved in its design spent a great deal of time discussing the content and optimum format as well as the potential users of this service. One of the results of these discussions was a decision to use keywords and/or subjects as the main access point. New users of the system or those unfamiliar with possible subject headings may browse the list of headings or insert the first few letters of a word and obtain a list of specific headings.

CALENDAR OF EVENTS:

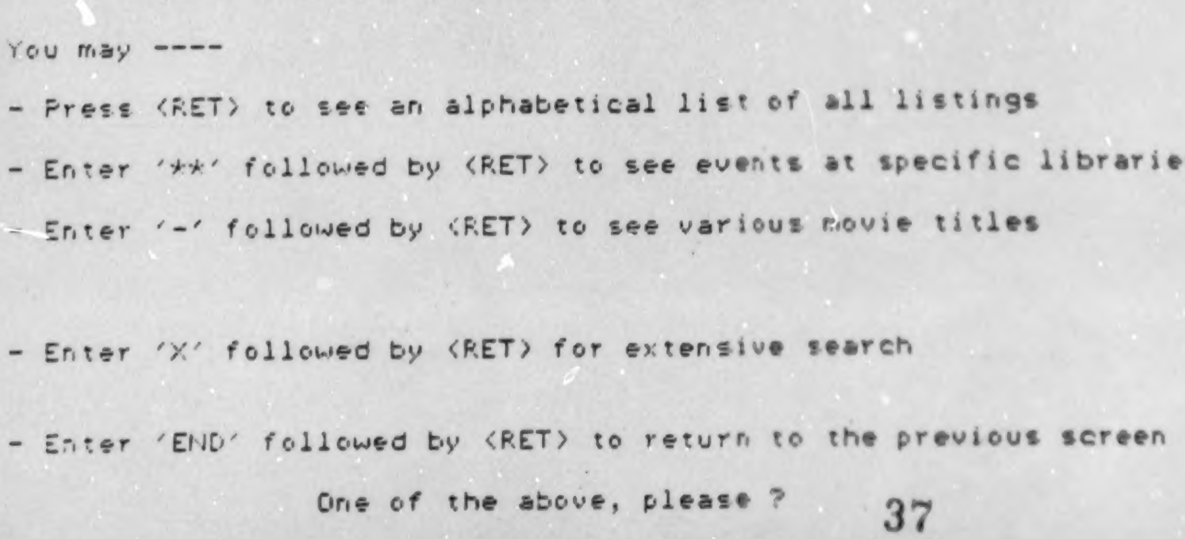
The Calendar of Events database is designed to enable people in the community to determine what cultural and musical events, community and local government meetings, seminars and workshops, courses, lectures and events for children and adults are taking place in the Pasadena area.

The primary sources of data are the organizations sponsoring these activities. Several of these organizations, such as the Pasadena Arts Council, Pasadena City College and the City of Pasadena Recreation Department, issue print calendars, brochures or booklets in order to publicize their activities. The Pasadena Public Library will work closely with these and other organizations. The organizations may participate in updating and maintaining records for their own activities. Library staff will monitor and edit data entered to ensure that it is standardized, complete and easy for the user to understand.

This database will be useful in a number of ways. It will perhaps be used most often by individuals who wish to attend the many cultural, entertainment and educational events in the community. Groups and institutions planning activities will now know what and when other events are planned. The database is an ideal way for organizations to reach a large audience in order to publicize their events.

Although there are a number of ways to access the data in the Calendar of Events, the records all contain the same information, including: name of the sponsoring organization, category of the event (i.e., drama, lecture, exhibit, film, etc.), title of the program or event, location, time, date and cost of the event. There is also space to include a brief description of the activity which might further clarify or explain the event to users.

There are many ways to access this database (Fig. 9). These are described in the software section of the report, but to summarize here, users have the following options: viewing a list of categories (Fig. 10) if they are looking for a type of event rather than a specific name or title; searching the records directly by keying in either the name of the event, the sponsoring organization or some other keyword; looking at a list of all events scheduled for a particular day (Fig. 11); viewing the Quick Calendar (Fig. 12), which is an actual monthly calendar which shows a code for all events on a particular day; and printing out a complete list or a subject list of events.



```
        * * *  The Pasadena Library Calendar of Events  * * *

You may ----

- Press <RET> to see an alphabetical list of all listings

- Enter '**' followed by <RET> to see events at specific libraries

- Enter '-' followed by <RET> to see various movie titles


- Enter 'X' followed by <RET> for extensive search


- Enter 'END' followed by <RET> to return to the previous screen

                    One of the above, please ?
```

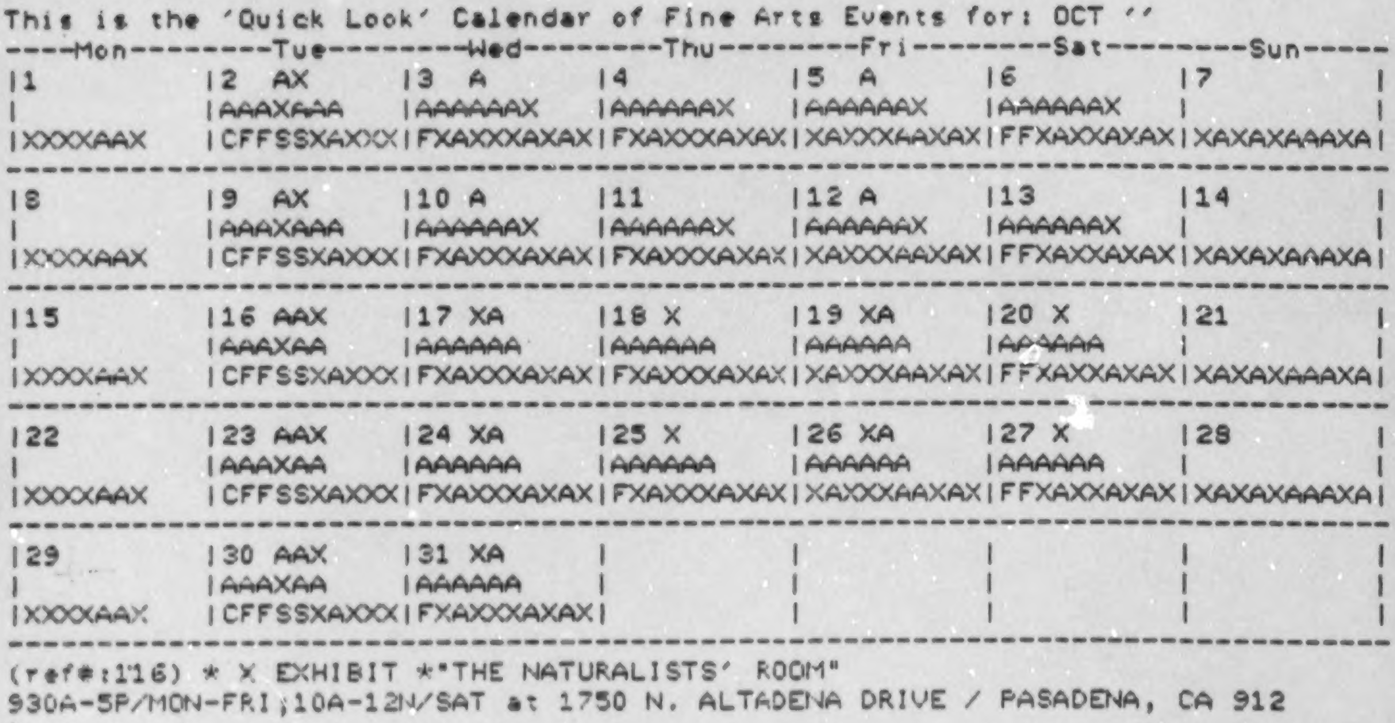
(Fig. 9 Calendar Search Options)

```
            <<<< This is the Pasadena Calendar of Events >>>>

          Following are categories currently on file -

 1) FILM              2) ADDRESS            3) CULTURAL           4) SPEAKER
 5) CHESS             6) FILM3              7) STORYHOUR          8) CHILDRENS FILMS
 9) CRAFTS           10) PUPPETS           11) TEST              12) CHILDREN'S PROG
13) ADULT            14) LIBRARY BOARD M   15) EXHIBIT           16) CHILDREN'S FILM
17) LECTURE          18) POETRY            19) MUSIC             20) DRAMA
21) AUCTION          22) ANIMAL            23) APPRAISALS        24) GARDENING
25) X EXHIBIT        26) ART GALLERIES     27) ART EXHIBIT



(100) To see all listings for a given 'sponsor' or (101) For a given 'location'


Choose a category. You may enter either the NAME or the NUMBER, then <RETURN>.
(or, to see ALL listings, simply 'tap' <RETURN>) . . . . . . ?
```

(Fig. 10 Calendar Categories)

```
'Detail info for listing '-SHOEMAKER AND THE ELVES' ( 1  listings)

        Originator : LIB
      Organization : PASADENA PUBLIC LIBRARY
          Category : FILM
             Title : FAMILY FILMS
             Price : FREE
             Phone : 405-4046
           Address : 285 E. WALNUT STREET (AUDITORIUM)
              City : PASADENA
           St Date : 11-MAY-84
          End Date : 12-MAY-84
         Time/Days : 200P\FRI; 1200P\SAT
                   : "TARENTELLA", "MONGREL DOG"
                     "WE CALL THEM KILLERS";"SHOEMAKER AND THE ELVES"
                     "WHY THE SUN AND MOON LIVE IN THE SKY"



                     (*'PALS' Ref No. 21 )
Enter 'S' and <RET> to start again ... or plain <RET> to continue search ?
```

(Fig. 11 Calendar Entry)



```
This is the 'Quick Look' Calendar of Fine Arts Events for: OCT ''
----Mon---------Tue---------Wed---------Thu---------Fri---------Sat---------Sun-----
|1         |2  AX      |3  A       |4          |5  A       |6          |7          |
|          |AAAXAAA    |AAAAAAX    |AAAAAAX    |AAAAAAX    |AAAAAAX    |           |
|XXXXAAX   |CFFSSXAXXX|FXAXXXAXAX|FXAXXXAXAX|XAXXXAAXAX|FFXAXXAXAX|XAXAXAAAXA|
------------------------------------------------------------------------------------
|8         |9  AX      |10 A       |11         |12 A       |13         |14         |
|          |AAAXAAA    |AAAAAAX    |AAAAAAX    |AAAAAAX    |AAAAAAX    |           |
|XXXXAAX   |CFFSSXAXXX|FXAXXXAXAX|FXAXXXAXAX|XAXXXAAXAX|FFXAXXAXAX|XAXAXAAAXA|
------------------------------------------------------------------------------------
|15        |16 AAX     |17 XA      |18 X       |19 XA      |20 X       |21         |
|          |AAAXAA     |AAAAAA     |AAAAAA     |AAAAAA     |AAAAAA     |           |
|XXXXAAX   |CFFSSXAXXX|FXAXXXAXAX|FXAXXXAXAX|XAXXXAAXAX|FFXAXXAXAX|XAXAXAAAXA|
------------------------------------------------------------------------------------
|22        |23 AAX     |24 XA      |25 X       |26 XA      |27 X       |28         |
|          |AAAXAA     |AAAAAA     |AAAAAA     |AAAAAA     |AAAAAA     |           |
|XXXXAAX   |CFFSSXAXXX|FXAXXXAXAX|FXAXXXAXAX|XAXXXAAXAX|FFXAXXAXAX|XAXAXAAAXA|
------------------------------------------------------------------------------------
|29        |30 AAX     |31 XA      |           |           |           |           |
|          |AAAXAA     |AAAAAA     |           |           |           |           |
|XXXXAAX   |CFFSSXAXXX|FXAXXXAXAX|           |           |           |           |
------------------------------------------------------------------------------------
(ref#:116) * X EXHIBIT *"THE NATURALISTS' ROOM"
930A-5P/MON-FRI;10A-12N/SAT at 1750 N. ALTADENA DRIVE / PASADENA, CA 912
A
```

(Fig. 12 Quick Calendar)

Initials indicate type of event (X=exhibit, A=adult program, F=film

Many of the ideas for the Calendar of Events had been developed by the consultant prior to the collaborative effort. However, the Library staff committee working on this database suggested several modifications and adjustments to take into account the variety of ways users may ask for information. These have been incorporated into the model database.

BUSINESS:

The Business database is designed to provide access to the functions and activities of the Pasadena business community. This file makes information available on Pasadena businesses including location, officers, product or service and size, which is often difficult to find. Transfer of information about the active and diversified Pasadena business community to a wide variety of users is essential to commercial activity and job seekers. The Business database is designed to serve as this vital link.

The Library is well known for its comprehensive business collection and as a result is relied upon heavily by local businesses. The Business database will continue the Library's involvement with and support for the business community in Pasadena. Staff anticipate use by sales and marketing personnel in locating businesses that can use their products or services. Access is possible by category or Standard Industrial Classification (SIC) number. These individuals need to know sales and the number of employees. Purchasing companies will need access in the same way to identify distributors and sales figures. Office personnel and secretarial staff will use this information to build mailing lists. It will be useful for real estate firms to locate clients and tenants. Since access by parent and subsidiary name is possible, the Business database will be used by managers and others to identify relationships between companies. Personnel staff can use the system for employment purposes. In addition to this business use of the system, the staff anticipates use by consumers looking for speakers from the business community, individuals attempting to locate products and services, and those seeking employment.

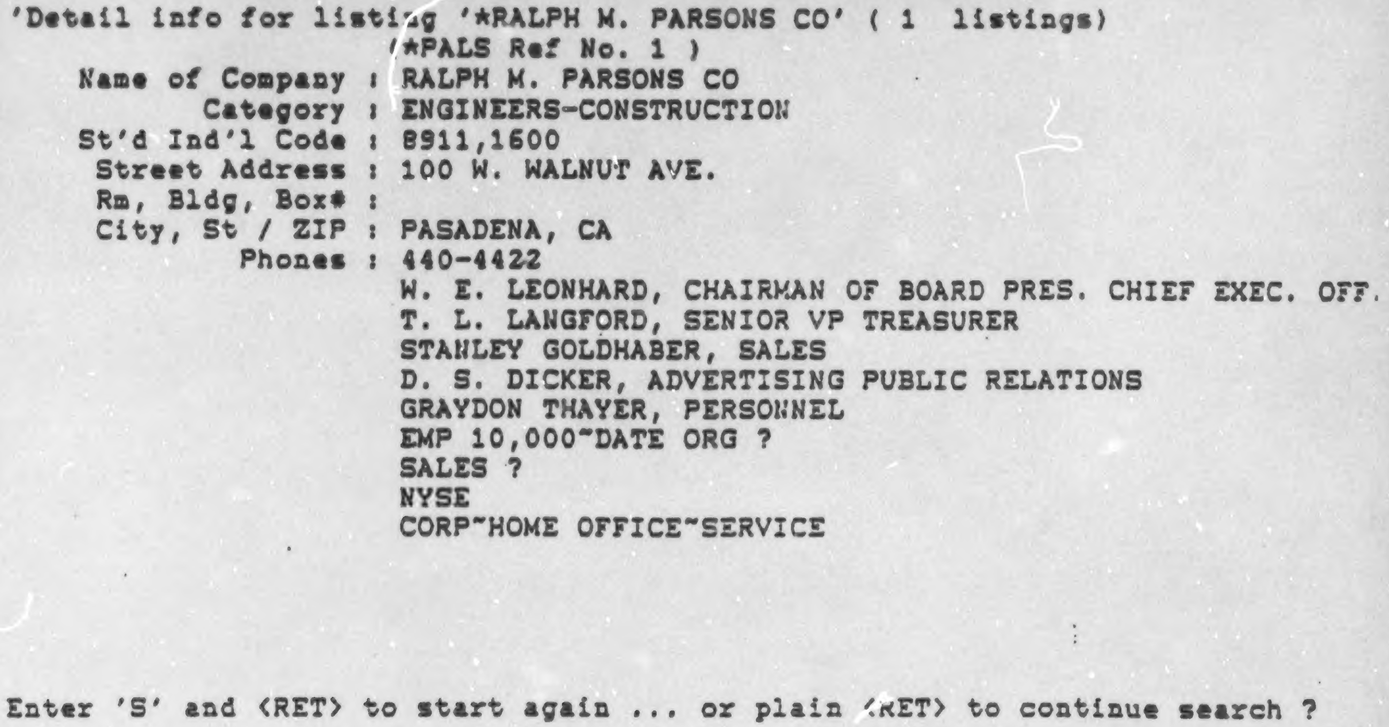
The model database is based on information from annual reports and business license data. It is hoped that this database will be built with information from the business licenses through the City, as well as from the annual reports of the larger Pasadena companies. Additional information would be retrieved by a direct mail questionnaire to the businesses in the community. This step may well be used in periodic updating of the database as well.

Records on Pasadena businesses include the name of the company, category, SIC code, address, phone, officers, number of employees, sales volume, stock exchange, and keywords. Categories will be assigned to each business in relation to the Standard Industrial Classification code (SIC). This code is assigned to all companies by the U.S. Department of Commerce based on the product or service they provide. Initially, the category field was at the top of the screen. This was because of the inclination toward a browsing subject approach by the consultant. Based on predicted library patron and staff use, this was modified.

This database will be kept up to date by the Library staff. This will be facilitated through the anticipated use of business license information. The mailing described above for verification and updating will be helpful as well. Business groups in the community may eventually be equipped with terminals to facilitate remote data entry and updating. The Chamber of Commerce may play a role here as well as interested individual businesses.

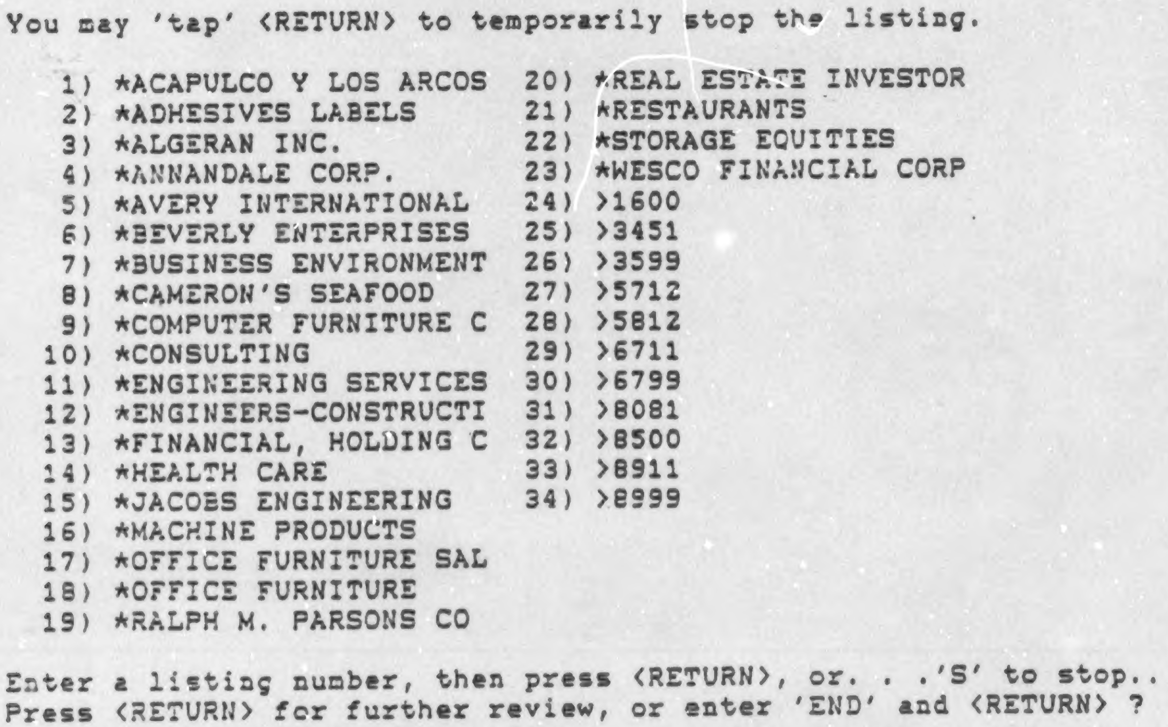
The options previously described above for searching are available with this database as well. Both a browsing and specific search are possible. The company name "Ralph M. Parsons" will bring up the specific record for that company (Fig. 13). The record can also be retrieved by the category "Engineers - Construction" or by SIC code. Users may browse the thesaurus to see what keywords have been used (Fig. 14) or browse by type of company (Fig.15). Choosing #8 would retrieve all companies providing "Furniture and Fixtures".

Staff involvement in the Business database consisted of steering committee discussions, as well as meetings between staff members and the consultant. Staff entered sample data from annual reports, a business license, and the telephone directory. Entering the sample data allowed for the category modification described above.



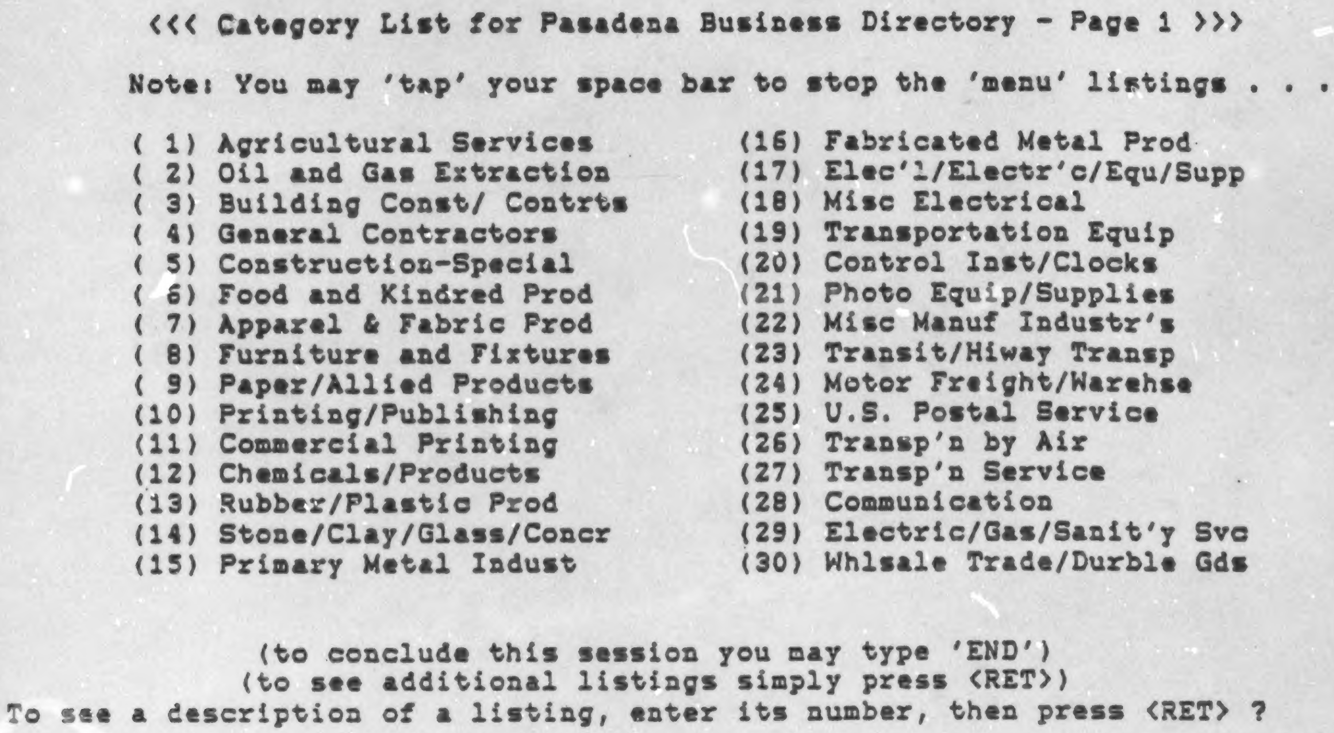
```
'Detail info for listing '*RALPH M. PARSONS CO' ( 1  listings)
                     (*PALS Ref No. 1 )
    Name of Company : RALPH M. PARSONS CO
           Category : ENGINEERS-CONSTRUCTION
    St'd Ind'l Code : 8911,1600
     Street Address : 100 W. WALNUT AVE.
     Rm, Bldg, Box# :
     City, St / ZIP : PASADENA, CA
             Phones : 440-4422
                      W. E. LEONHARD, CHAIRMAN OF BOARD PRES. CHIEF EXEC. OFF.
                      T. L. LANGFORD, SENIOR VP TREASURER
                      STANLEY GOLDHABER, SALES
                      D. S. DICKER, ADVERTISING PUBLIC RELATIONS
                      GRAYDON THAYER, PERSONNEL
                      EMP 10,000~DATE ORG ?
                      SALES ?
                      NYSE
                      CORP~HOME OFFICE~SERVICE


Enter 'S' and <RET> to start again ... or plain <RET> to continue search ?
```

(Fig. 13 Business Entry)



```
You may 'tap' <RETURN> to temporarily stop the listing.

   1) *ACAPULCO Y LOS ARCOS  20) *REAL ESTATE INVESTOR
   2) *ADHESIVES LABELS      21) *RESTAURANTS
   3) *ALGERAN INC.          22) *STORAGE EQUITIES
   4) *ANNANDALE CORP.       23) *WESCO FINANCIAL CORP
   5) *AVERY INTERNATIONAL   24) >1600
   6) *BEVERLY ENTERPRISES   25) >3451
   7) *BUSINESS ENVIRONMENT  26) >3599
   8) *CAMERON'S SEAFOOD     27) >5712
   9) *COMPUTER FURNITURE C  28) >5812
  10) *CONSULTING            29) >6711
  11) *ENGINEERING SERVICES  30) >6799
  12) *ENGINEERS-CONSTRUCTI  31) >8081
  13) *FINANCIAL, HOLDING C  32) >8500
  14) *HEALTH CARE           33) >8911
  15) *JACOBS ENGINEERING    34) >8999
  16) *MACHINE PRODUCTS
  17) *OFFICE FURNITURE SAL
  18) *OFFICE FURNITURE
  19) *RALPH M. PARSONS CO

Enter a listing number, then press <RETURN>, or. . .'S' to stop..
Press <RETURN> for further review, or enter 'END' and <RETURN> ?
```

(Fig. 14 Business Keyword Listing)



```
          <<< Category List for Pasadena Business Directory - Page 1 >>>

    Note: You may 'tap' your space bar to stop the 'menu' listings . . .

    ( 1) Agricultural Services         (16) Fabricated Metal Prod
    ( 2) Oil and Gas Extraction        (17) Elec'l/Electr'c/Equ/Supp
    ( 3) Building Const/ Contrts       (18) Misc Electrical
    ( 4) General Contractors           (19) Transportation Equip
    ( 5) Construction-Special          (20) Control Inst/Clocks
    ( 6) Food and Kindred Prod         (21) Photo Equip/Supplies
    ( 7) Apparel & Fabric Prod         (22) Misc Manuf Industr's
    ( 8) Furniture and Fixtures        (23) Transit/Hiway Transp
    ( 9) Paper/Allied Products         (24) Motor Freight/Warehse
    (10) Printing/Publishing           (25) U.S. Postal Service
    (11) Commercial Printing           (26) Transp'n by Air
    (12) Chemicals/Products            (27) Transp'n Service
    (13) Rubber/Plastic Prod           (28) Communication
    (14) Stone/Clay/Glass/Concr        (29) Electric/Gas/Sanit'y Svc
    (15) Primary Metal Indust          (30) Whlsale Trade/Durble Gds

                  (to conclude this session you may type 'END')
              (to see additional listings simply press <RET>)
To see a description of a listing, enter its number, then press <RET> ?
```

(Fig. 15 Business Categories)

Standard abbreviations were also considered for descriptive terms applicable across the database. These included the stock exchanges, officer titles (such as Chairman of the Board, Executive Vice President, etc.) and other terms such as corporation, company, incorporated, limited, etc. The number of employees and volume of sales were also assigned letters to indicate ranges of numbers. (Fig.16)

One of the difficulties encountered with this database is also the reason why it is so important to create, namely the information is hard to find. It is hoped this problem will be resolved by using business license data provided by the businesses when registering with the City. Obtaining this information needs to be further pursued by Library staff. Providing this type of information to the Pasadena community will meet the needs of local businesses, city governments, consumers, and job seekers. We anticipate that this database will be heavily used and provide a valuable service to the community as nothing this comprehensive has existed before.

EXAMPLE ONLY

Symbols, abbreviations and codes are not used widely, but are necessary to make the information most useful:

ASE	American Stock Exchange
Chm Bd	Chairman of the Board
Co	Company
Corp	Corporation
Ex	Executive
Ex VP	Executive Vice President
Inc	Incorporated
Ltd	Limited
M	Thousand

(cont.)

Standard Industrial Classification Code is a widely recognized code devised by the Federal Government, Bureau of the Budget, Executive Office of the President, for use in classifying establishments by the major type of activity in which each is engaged. It is similar to the category listing and may be used in much the same way.

Number of Employees

A = 1 - 50
B = 50 - 500
C = 500 - 2,000
D = 2,000 - 10,000
E = over 10,000

Volume or Sales

A = Under $250,000
B = $250,000 to 500,000
C = $500,000 to $1 million
D = $1 to $5 million
E = $5 to $10 million
F = $10 to $25 million
G = $25 to $100 million
H = Over $100 million

(Fig. 16 Business Abbreviations)

COMMUNITY ORGANIZATIONS:

The Community Organizations database is designed to enable people in the City of Pasadena to find information about non-profit community resources such as clubs, civic and fraternal organizations, and social welfare and service organizations. This resource was originally compiled by library staff and published by the Library as the Pasadena Community Organizations Directory. It is updated annually and is currently published in cooperation with the Pasadena Chamber of Commerce as part of their Business Directory. The information contained in the directory was compiled from data furnished to Library staff by members of each organization listed. Information in the database will be drawn from this library resource.

Each record contains the category, organization name, contact, address, phone, hours or meeting times, description and keyword. A category will be assigned by Library staff to define the basic thrust of each organization such as alumni groups or drug rehabilitation. Descriptions were written by the organizations to explain the purpose, function, and/or services provided. Necessary modifications of the screen arrangement include the name of the organization as the first field, as well as a labelled field for meeting times.

The Community Organizations database will be kept up to date by Library staff. Continuing the updating procedure used for the printed directory, organizations will be contacted and the information will be verified and updated. Library staff have developed a form to be used in gathering information on new organizations in Pasadena (Fig.17 & 18). In addition to what is listed in the record description, this form contains membership requirements, fees or dues, publications/newsletters, date of contact, and space for comments. This form could easily be used for updating purposes by mailing the form to the organization and following up with telephone query. These updates could be done by the organizations themselves by using microcomputers, terminals or cable access at either their own facilities or the Library.

This database is searched like the others described in this report. If the user wants to know which community organizations he/she can contact regarding alcoholism, he/she can retrieve these records by choosing the key word "Alcoholism" from the list of keywords or can perform a specific search with the word "Alcoholism" (Fig. 19 & 20).

Staff involvement consisted of staff and steering committee discussions and planning with the consultant. Sample data from the printed Organizations Directory was entered. Several discussions resulted from data entry about the need to search by specific organization name. This was accomplished by the specific search method but continued refinements will allow precision retrieval.

The Library has a strong collection of Pasadena materials. The collection, updating, and maintenance of these database files of Pasadena organizations will provide greater access to current organizations. This database will provide a vital service to community groups, City government, and local businesses, as well as new and longtime Pasadena residents.

Legal Name of Organization: Pasadena Ballroom Dance Association

Mailing Address: 268 Bellefontaine, Pasadena 91105

Telephone No: 799-5914 or 799-5689

Current President or Contact Person: Erin or Tami Stevens
Classes start every 6 weeks - Level I and Level II

Meets: Wednesday (Date) 7:00-9:30 p.m. (Time)

Meeting Place: VASA Auditorium (Name) 578-9959 (Telephone)

2031 E. Villa, Pasadena (Address)

Officer Elections Held: --- Month Installed ______

Program or Purpose: To provide lessons and programs for those interested in ballroom dancing. Group also goes on field trips such as Myron's Ballroom.

Membership Requirements: None. "Come to class"

Key Words Describing Organization: Social - fun

Fees/Dues: 6-week course - $24.00 Single class - $5.00

Will Send Info: ☒ Yes ☐ No

Publications/Newsletters (title, frequency, charge)

Flyer about every 6 weeks

Will Add to Mailing List: ☒ Yes ☐ No

4/16/84
Month/Year

P. Owen
By

Patron is going to send article about group that appeared in LAT Home Section

(Fig. 17)

SOCIAL WELFARE/SERVICE ORGANIZATIONS

Legal Name Of Organization: American Head Trauma Alliance

Mailing Address: P.O. 711046, Los Angeles, California 90017

Telephone No: 818/246-3252

Contact Person: Roberta Ford, Secretary to the Board and Director

Hours: M-F 9:30 a.m. - 9:30-10:00 p.m.

Program or Purpose: Development and operation of residential rehabilitation facilities for head-injured young adults.

Area Served: Eligibility and primary area will be: Foothill area, includes Glendale, Pasadena, Burbank and L.A. County (unincorporated) surrounding area - Southern California. Referral service available nationwide.

Key Words Describing Organization:

Comprehensive rehabilitation and residential facilities for head-injured young adults.

Fees/Dues: If money is secured - fee will be $3,500/month. There will be full or partial scholarships available as needed.

Will Send Info: ☒ Yes ☐ No

Publications/Newsletters (title, frequency, charge):

Alliance Advocate - quarterly - and brochures. Will mail to Carolyn.

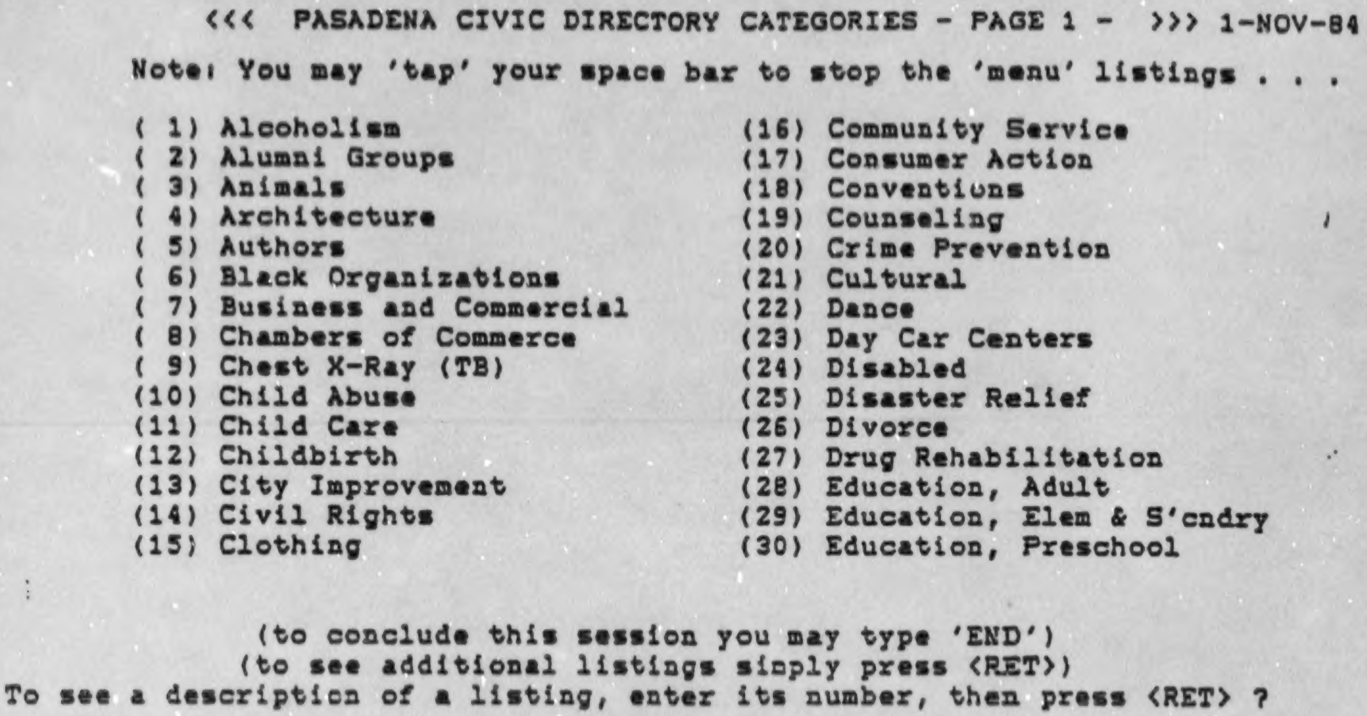
Will Add to Mailing List: ☒ Yes ☐ No

5/23/84 Updated 7/24/84
Month/Year

P. Owen
By

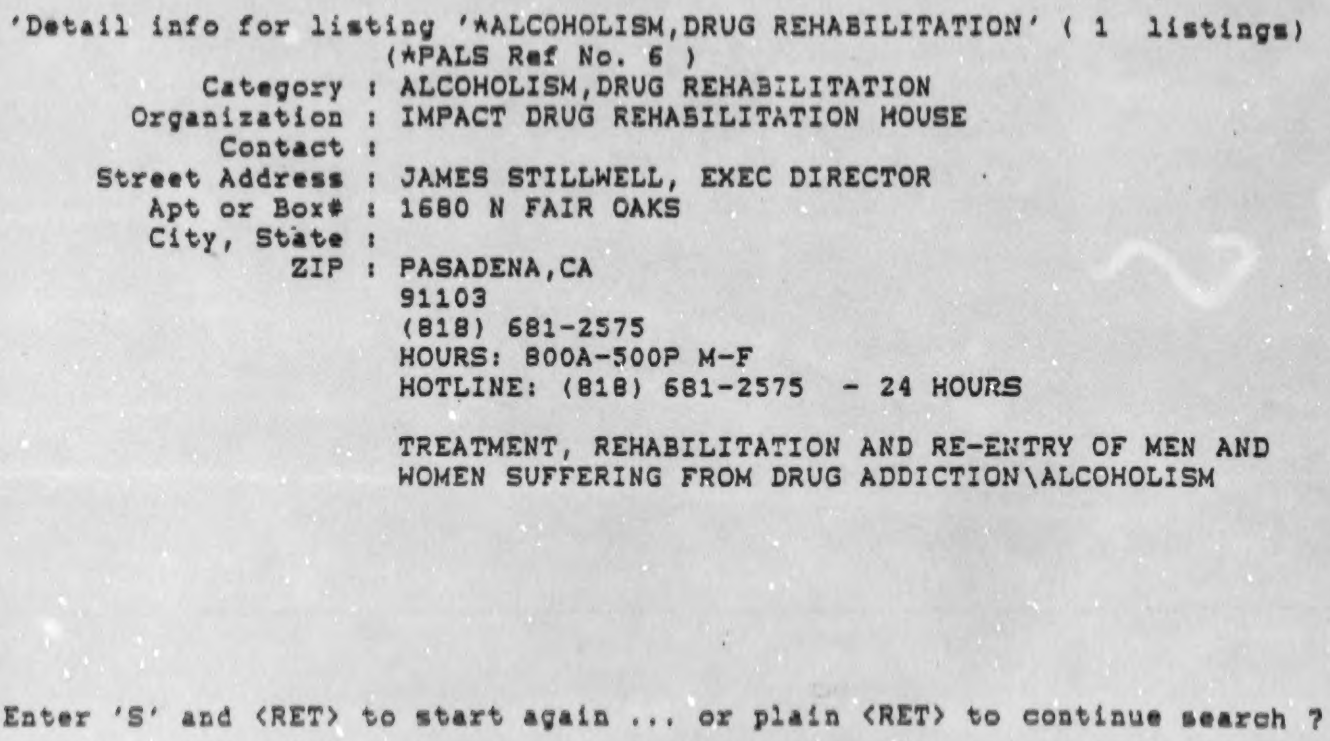
OVER

(Fig. 18 Social Welfare/Service Organizations Update)



```
         <<<  PASADENA CIVIC DIRECTORY CATEGORIES - PAGE 1 -  >>> 1-NOV-84
      Note: You may 'tap' your space bar to stop the 'menu' listings . . .

      ( 1) Alcoholism                      (16) Community Service
      ( 2) Alumni Groups                   (17) Consumer Action
      ( 3) Animals                         (18) Conventions
      ( 4) Architecture                    (19) Counseling
      ( 5) Authors                         (20) Crime Prevention
      ( 6) Black Organizations             (21) Cultural
      ( 7) Business and Commercial         (22) Dance
      ( 8) Chambers of Commerce            (23) Day Car Centers
      ( 9) Chest X-Ray (TB)                (24) Disabled
      (10) Child Abuse                     (25) Disaster Relief
      (11) Child Care                      (26) Divorce
      (12) Childbirth                      (27) Drug Rehabilitation
      (13) City Improvement                (28) Education, Adult
      (14) Civil Rights                    (29) Education, Elem & S'cndry
      (15) Clothing                        (30) Education, Preschool


             (to conclude this session you may type 'END')
            (to see additional listings sinply press <RET>)
To see a description of a listing, enter its number, then press <RET> ?
```

(Fig. 19 Organizations Categories)



```
'Detail info for listing '*ALCOHOLISM,DRUG REHABILITATION' ( 1  listings)
                    (*PALS Ref No. 6 )
         Category : ALCOHOLISM,DRUG REHABILITATION
     Organization : IMPACT DRUG REHABILITATION HOUSE
          Contact :
   Street Address : JAMES STILLWELL, EXEC DIRECTOR
      Apt or Box# : 1680 N FAIR OAKS
      City, State :
              ZIP : PASADENA,CA
                    91103
                    (818) 681-2575
                    HOURS: 800A-500P M-F
                    HOTLINE: (818) 681-2575  - 24 HOURS

                    TREATMENT, REHABILITATION AND RE-ENTRY OF MEN AND
                    WOMEN SUFFERING FROM DRUG ADDICTION\ALCOHOLISM




Enter 'S' and <RET> to start again ... or plain <RET> to continue search ?
```

(Fig. 20 Organizations Entry)

LIBRARY RESOURCES

The LSCA grant proposal identified as one of the projects primary goals providing access to the bibliographic holdings of the Pasadena Public Library. In 1982, the Glendale and Pasadena libraries contracted with Geac Computers, Inc. (Markham, Ontario, Canada) for an automated circulation and acquisition system. By December, 1983, the two central libraries and 13 branches were online for circulation. Some 350,000 titles, including books, sound recordings, musical scores and other audiovisual materials were loaded into the database and two million items were readied for circulation. The two library systems have a total of 180,000 registered borrowers and an annual circulation of 2.1 million. The Pasadena Library is still entering portions of the collection including several thousand reference titles, sound recordings and musical scores.

In addition to the circulation functions of checkin and checkout of materials, patron files, a reserve book room function, materials booking system, and a hold system, the Geac system provides a community access module and a public query system. The community access module is accessible via a dedicated dial access port. The module provides user access to the public query module.

The Geac system's public query function is the original version of the online catalog. The module is menu driven, with five selections on the main menu: Look for a book, Place a hold on a book, Display borrower information , Find out about the reserve book room, and Show borrower library activity. (Fig. 21). The Library can make any one or all of these selections available to the public.

```
Function:  Main Selection Menu

Enter a number which corresponds to the list below, then press 'SEND'

          1 - Look for a book

          2 - Place a hold on a book

          3 - Find out about the Reserve Book Room

          4 - Display borrower information

          5 - Show borrower Library Activity

Enter:
```

(Fig. 21 Geac Main Selection Menu)

PALS will initially provide access to the "Look for a book" option. Typing the number '1', brings up the next screen (Fig. 22) which provides the user with four access points - author, title, subject and call number and a fifth selection - return to main menu.

```
Function:  Look up a book
Enter the letter that corresponds to what you want, then press 'SEND'

          T - Look for a book using a TITLE

          A - Look for a book using an AUTHOR

          C - Look for a book using a CALL NUMBER

          S - Look for a book using a SUBJECT

          X - Go back to Main Selection Menu
```

(Fig. 22 Book Search Options)

After the user selects an index, he/she is instructed to enter the desired search key.(Fig. 23)

```
Enter title:                                 <then press 'SEND'

Enter the text for the alphabetic search above, OR

Enter 'E'; and press 'SEND' to go back to Search Type choice, OR

Enter 'X' and press 'SEND' and go back to Main Menu
```

(Fig. 23 Title Search Screen)

Five brief title records are displayed with the third record being the closest to the search key.(Fig. 24)

```
Enter Title: JOY OF COOKING

1.  Title: Joy of Computers / Peter Laurie
    Author: Laurie, Peter                    Call number: 510.78 L

2.  Title: Computer Consciousness $ B Joy of Computers
    Author: Covvey, H. Dominic               Call number: 651.8

3.  Title: Joy of Cooking
    Author: Rombauer, Irma (von Starkloff)   Call number: 641.5 R

4.  Title:  Joy of Cooking
    Author: Joy of Cooking                   Call number: ST 661

5.  Title:  Joy of Cooking
    Author:  Rombauer, Irma von Starkloff    Call number: 641
```

(Fig. 24 Titles Retrieved)

The record includes author, title, and title level call number. The user may now retrieve detailed information on one or more of these records or browse forward or backward through the file for additional records. More complete bibliographic information including edition, publisher, notes, standard numbers and subject headings can be selected; copy level information including copy level call number, shelf status and library location (branch or central library) is detailed, or the user can return to the main menu.

As with the other PALS databases, a welcome screen providing an explanation of the Public Access Module has been designed. The public query module uses the circulation bibliographic database for its online catalog. This database has a number of short-comings including several thousand duplicate title records, many title records with no copies attached, and a primitive subject access with no authority control system. Lastly, the database is not in MARC format, however, all important bibliographic data is included in the record. The welcome screen will have to include instructions in the use of the database and an explanation of the shortcomings.

The Library anticipates bringing the public query system online in the Central Library by December, 1984 with the installation of several public use terminals. Plans include upgrading public access to the current online catalog mode and expanding system wide by June, 1986.

SYSTEM DESIGN

Our first task in considering the kind of system we would need was to analyze the special requirements and constraints that the commitment to the maintenance of the selected data bases would impose. In designing PALS, the steering committee identified a number of characteristics that we felt must be included in the system design, whether we selected an existing database management system or designed our own system.

1. PALS must be an online system, accessible to the general public 24 hours a day, 7 days a week.

2. The system should be designed to operate in a commercial grade multi-user hardware environment that is capable of easy expansion, with an initial cost as low as possible.

3. The system should be as user-friendly as possible, with little use of written manuals required for either access or maintenance of the database.

4. Each database should be treated individually so that the constraints of one do not become the constraints of another; yet global searches should be possible, where desired.

5. While responsibility for the databases must always be in the hands of the Library personnel, the design should allow members of the community to maintain those portions of the database for which they are the original source. It is desirable that maintenance functions can be done from the microcomputers or CRTs in the community, using any of the standard word processing and communications programs available for those machines or from terminals located in the Library.

6. Adequate security must be provided. Provision should be made to assure that dial-up users do not have access to programs or data for which they are not authorized. A method of logging system use should be incorporated into the design. The logging system should provide for the analysis and monitoring of system usage and possible tracking of patron searches should the system be expanded to commercial databases.

7. The system should be accessible by a variety of terminals and microcomputers, using either dial-up telephone connections or the cable system, within the Library, or from remote locations.

8. Lastly, the system must be expandable, easy to maintain, and cost effective.

Five of the six local databases were designed with these requirements in mind. The sixth database, the Library's bibliographic holdings, is the basis of the Library's automated circulation system, using GEAC Computer, Inc. Library System software. Access to the database, including the bibliographic record and shelf status information is provided through the Community Access Module.

The steering committee felt that PALS should not be static and that each of the databases should expand to meet local needs. Potentially, other databases can be created as needs are identified following the same criteria.

As discussed, model databases were created to assist in the development of programs and to allow review by staff and community members. EMDA, Inc. provided the necessary hardware, a cell from the EMDA computer hive, to build the databases. The cell consists of hardware, the operating system, and proprietary software that is uniquely adapted to easily create, modify, update, and access the databases with which we were concerned.

VIII. SOFTWARE DESIGN

In the design of a local database system two options are available in the area of software. The first provides for use of existing commercial software packages that can be modified to meet local needs. The second option involves in-house design and implementation of the databases, utilizing consultants familiar with the field or in-house staff. The Pasadena Public Library selected the second alternative as a result of the work already done by EMDA.

COMPATIBILITY

The EMDA system is designed in such a way that a user may sign onto the system with a variety of different protocols, to adapt for a variety of microcomputers or terminals that are being used. The software is designed to permit the 'overlaying' of instructions that control characteristics such as erasing the user's screen, positioning the user's cursor, and erasing a line on the user's terminal.

The system is designed to work on screens that are 80 columns wide and 24 lines deep. However, users with systems having less than those proportions may use the system, but will find that the appearance of the screen will not be as graphically pure as those who have terminals with 80-column by 24-line capability. The system is currently designed to accept a variety of microcomputers and terminals (Fig. 25).

```
Please indicate your 'terminal' type:

enter a NUMBER followed by <RETURN>

(1)VT100 (ANSI st'ndrd)
(2)VT52 compatible
(3)IBM 3101
(4)Tele-Video
(5)RCA TV keyboard
(6)Apple III
(7)Hazeltine 1500
(8)Wizard-80 (Apple II)
(9)Perkin Elmer 550
(10)IBM-PC / PC-Talk
(11)Home computer 32-40 ch'trs
(12)Hard Copy
(13)Hewlett Packard Micro 5
Type a number please ?
```

(Fig. 25 Access to PALS)

As new equipment is available a simple addition of the protocols for those terminals may be included in the selection. With the primary purpose of the system being low cost, interactive method of disseminating textual representations of only the lowest levels of community interest information, North American Presentation Level Protocal Syntax (NAPLS) standards have been included in the systems design at this time.

FILE STRUCTURE

The file design used for our test purposes followed quite closely the design used in most modern database oriented systems. A Master File was created for each of the databases, and index files created for any of the fields that appeared to be desirable. To retrieve information the user chooses from the index file the record to be examined, and that record is then displayed on the screen. To enhance this concept, and to permit a wider degree of flexibility in the kind of information that could be stored, a system similar to footnotes was included. Each master file record may carry footnotes. The construction of the master files in each database for the test system was identical, making possible the easy incorporation of all master files into one large database, should that have become desirable.

MASTER FILES

The intent of this file is to function in a manner similar to a card file. This approach was taken for two reasons. First, to aid individuals working with the system in understanding the design of the master file and to provide an easy explanation of the file. Secondly, it permits an unusual degree of flexibility in the way information will be accessed by both novice and sophisticated users.

Each of the five databases has its own master file. The master file is comprised of records, each of which can hold about 1200 characters. These master file records contain summary information about a subject, corporation, person, or information category. In many cases, such summary information is all that is necessary to be of value. On other occasions, additional information may be necessary. In those cases, each of the master file records can also act as pointers to extended files located within the system. These files can contain an almost unlimited amount of information, including full text data. This technique has been included in the system to permit extensive participation by community members in the creation and maintenance of those files that relate to their own activities.

The MASTER file records are created and updated by means of password-protected programs that, while easy to learn to use, are not accessible except by authorized Library personnel or designated members of the community.

In the model databases, the master files for each database were all identical in construction. The master file is a random access file with 1200 characters for each record, of which about 100 are reserved for system use. The screen format is 60 columns by 20 lines. When viewed with an 80-column-wide screen, 20 columns are allocated for format descriptions which are not stored in the master file. These format descriptions may or may not be displayed on terminals retrieving the information, as is appropriate.

While the construction of the master files for each of the databases is identical, the internal formatting of the information within each record is different. This feature is controlled by imbedded data, rather than by file access, to allow for the maximization process providing faster chaining. Each database has its own set of entry and access programs.

EXTENDED FILES

The extended files are sequential files and may be created by anyone having access to an ASCII oriented word processor system and appropriate authorization. Community organizations, City agencies and/or civic groups, may utilize their own equipment to create and/or modify some of the in-depth information about their organization that will be available to the public. These extended files may also be created and modified using the facilities of the PALS main computer. If the record is externally created or updated, it may then be transferred to the PALS system via telephone, using modems and communications programs.

A system has been created to receive these extended files that are created external to the system. When these extended files are transferred into the PALS system they are loaded into a special section in the PALS system, stored with a special name designated by the software system, and held for review by a member of the Library staff. The designated staff member reviews records for their applicability. If the information meets the established criteria, they are converted to extended files accessible by users, via the pointers. A note is inserted into the master file record which denotes that more information is available on that subject, and the users may elect to access it or not, as necessary.

The extended files are sequential ASCII character files with no fixed record length. The carriage return (ASCII character 13) is used to delimit the end of a line. The word 'END' on its own line is used to indicate the end of the file. The software in the receiving file strips out any undesirable non-printing characters, converts the 'END' to its own internal end of file (EOF), and stores it in a packed format.

When the PALS system receives an extended file, it maintains an independent directory of such receipts. The name of the record creator, the file name that was assigned by the creator, the time and date of the receipt is logged onto the system. A temporary name is assigned to the file, and it is stored on the mass storage device. This file is now accessible only by Library personnel through a special internal utility program. After the Library personnel review it for applicability, it is converted to an extended file, and is made available to users who access it through the master file pointer system. Updates to the file can be made by loading a new version of the record into the database, or Library personnel can edit the file online using the system's editing facility.

INDEX FILES

Special indexing programs exist for each of the databases, which permits the creation of index files in a unique manner, for example, the requirements of the 'Calendar' are substantially different from the other databases. These index files are keyed to the major subject headings in each of the master file records, and also on key words or phrases flagged by the person entering the data. In this way the database creator can control exactly how the indexing should be done. A single file for each database contains all the words and phrases which may be used by the access programs for each of the databases. These access points are added to the index file, and may be deleted at the time of entry or modification of the data. The entire file may be regenerated by utility programs set up for this purpose.

Index files are first sorted and/or merged depending on the circumstance, into mirror files. They are then converted to online status to reduce the time to a few seconds before the record is accessible to users. Information contained in the extended files is not indexed, however, keywords and phrases found in the master file record may be included in the index.

REFERENCE FILES

Each database is driven from a master menu. This master menu permits three choices. Included in the choices is the ability to access a full description of the database, its purpose, its history, and information about how to use it. These information files are referred to by system programs as the reference files. Some of the databases have sub-menus, and these sub-menus also may have reference files where desired.

Reference files are sequential files, and may be created in the same manner as other file records, internally or using external word processing equipment, and transferred to the PALS system via File Reference System. They may be as long as is needed to conveniently transfer and all sequential files that are made available to the users may be interrupted at any time during the user's session.

MENU FILES

As mentioned above, there is a master menu from which all databases are accessed. There is also a utility menu for use by Library personnel, and some of the databases use sub-menus.

All menus have sequential files associated with them to control the menu items. These are modified by the internal editing system, and may contain up to 32 items, each of which may also have a reference file associated with it. Each menu file includes as its first item the number of items in the file. Each item in the menu file includes the text that will appear on the menu, and a non-printing program name associated with that menu item. The program thus accessed is a CALL to another program. This structure is part of the security system built into the EMDA software, and part of the built-in accounting system that tracks the use of the system. This is of particular importance if the Library should ever decide that specific database accesses should carry an access fee.

PROGRAMS

As outlined earlier, the test system was developed using EMDA proprietary software, which in turn takes advantage of the cell and hive concept which EMDA uses because of its reliability factor and incremental growth characteristics. One advantage of this design is that a single low-cost cell can handle up to three simultaneous users, with a minimum memory requirement of only 64K bytes). The programs take advantage of a very fast chaining function which permits EMDA to design the software in very small modules.

The development software used by EMDA is a form of multi-user BASIC language enhanced to be compilable, with numerous special communications and file handling functions that permit the use of special techniques for added system security and accountability. Each database has an individual set of programs permitting access by users in a variety of ways. One technique can be called the assisted prompt technique, in which the various index files are displayed in such a way as to permit easy browsing of the files. Another method is the sub-menu technique, in which lists of information can be displayed, giving the user an opportunity to quickly get a general picture of the categories that they choose. This technique is used as part of the Statistics database, and is available to the others if it should prove to be desirable.

The Calendar database access programs were designed to include an additional feature. A graphic representation of an entire month is displayed on the screen, with code letters showing the different type of events for each day. The program creates the calendar for the month requested, using an algorithm embedded in the program, and data embedded in the first 14 records of the calendar's special data tree file.

This file, which is updated each time a new calendar entry is made, is a random access file with pointers to the calendar master file. It makes the creation of the graphic calendar simple and makes accessing all events for any given date very easy. The graphic display of the month-calendar creation is also stored in a small temporary file and may be used without regeneration as long as no new calendar events were added for that month. The access program determines whether or not the regeneration should take place.

Each program in the system logs in and out to a logging file, logging when it is accessed and when it is abandoned. No program may be accessed without the user having brought with it a special code assigned to him by the system for that particular session. If the code is not present, or is not legitimate, the user will be logged off, and asked to sign-in again. Additionally, the system has been designed to include a recovery system in the event of a system failure.
The process for initial registration as a user into the system is fully automated, and if desired, users may register themselves, giving all necessary information. The system assigns the initial password, and a secondary confirmation code. These codes must be used by the user to sign in again, and are requested by the system whenever there is a questionable transaction occurring. Although available, the use of this feature in PALS is as yet undetermined.

THE DATA ENTRY PROGRAMS

After experimenting with individual data entry programs, it was decided that for ease of training and database maintenance, that the data entry programs for each database would be as consistent as possible. The data entry programs are available to authorized Library staff using equipment in the libraries, or to designated community members, using their own equipment or equipment located in the Library. Programs are menu driven, and self-explanatory. No user manuals are necessary as the process is explained on each screen. New data, reference to old data, correction or deletion of the old or new data, printing of the master file records, and the listing and printing of any of the extended files associated with each record are done via the data entry program.

THE ACCESS PROGRAMS

Each database has its own set of access programs. Although similar, they can be modified to account for different requirements as they develop, without being constrained by considerations of the other databases. The initial program accesses the master menu, and permits the access of all of the reference files, which explain in detail the various databases.

From this menu the program permits the user to perform any one of three functions: 1) access the reference files, 2) browse through the key words and phrases and access the data as a result of choices made, 3) utilize the extensive search capability to find not only keyword but also non-keyworded records. If the user chooses the browsing technique, an option is given to begin the browse with a keyword bypassing the next menu.

This dual capability in the search process was meant to provide three levels of users with a form of database use consistent with experience and interest. The first level is for the casual, or first time user, where browsing offers a good way to be introduced to the kinds of information resident in that database. The second level is the home or business user who has used the system a few times before, and knows the keywords access points he is interested in right away. The third user is the professional librarian using the system to answer questions posed either on the phone or in person by those who do not wish to use the system themselves. It permits extensive searching of the database, but may take a little more expertise than using the structured pre-coordinated indexes.

SYSTEM STORAGE REQUIREMENTS

While all systems like this one will continue to grow, it is felt that for the Pasadena PALS system, twenty megabytes of mass-storage will be adequate to have sufficient amounts of data for online retrieval for the databases described here, to be of substantial value. There is no doubt that this need will grow. It would not be unreasonable to expect to add twenty megabytes per year.

IX. HARDWARE REQUIREMENTS

As a public access online system, hardware reliability is a prime consideration. Ideally the system should be available to the public twenty-four hours a day, seven days a week. Although most computer systems built by the major manufacturers such as IBM, Digital Equipment Corp., etc. are much more reliable today than they were a few years ago, it must be recognized that all systems have components that fail from time to time for one reason or another. System design must be such that it accounts for these failures, and can traverse them in some comfortable manner.

In considering the architecture for the PALS system, equipment cost must also be taken into consideration. In the future libraries around the country will be providing electronic access to their collections and files. While some of the larger metro-politan systems may be prepared for the costs of the large main-frames, many libraries will not.

Since the PALS system expects not only to be able to allow users to dial-in, but also to be able to interact with other computer systems, and a myriad of micro-computers and terminals, there must be a broad degree of compatibility built into the system hardware and software. The Pasadena Public Library has a variety of terminals, and microcomputers supporting an automated circulation system, online database searching, and office automation, making it desirable to permit the existing equipment to access the PALS system as well as the other automated systems. A number of computer manufacturers including IBM, Digital Equipment, Texas Instruments, Tandem, and others, provide the capabilities described above. A system with characteristics similar to these requirements is in operation at the EMDA offices.

CENTRAL PROCESSING UNIT

EMDA's hardware design has addressed the issues of reliability and flexibility. Instead of using a single large minicomputer or mainframe, EMDA uses smaller, Digital Equipment microcomputer modules, and linking several of them together so that each has its own mass storage, but each can share a central mass storage device as well. EMDA uses DEC PDP-11/23 modules as "cells". Each module can serve several users simultaneously, with a minimum of 64K bytes memory required. By grouping three or four cells together, and interconnecting them with a modified form of local area network, a reliable, yet relatively low-cost system can result.

Digital Equipment computers were selected because they have long been a pioneer in this type of networking and hardware for such interconnection is relatively low cost. The basic hardware costs for a starter system, including six to nine ports should be in the $30,000 - $45,000 range. The cost will vary with the number of peripherals (disk storage, printers, terminals, etc.) desired to support the system. Such a system, consisting of two or three modules, would provide reliability because the failure of one module would not cause the entire system to be down. Likewise, because of the modular design, a system of this type can grow as needed. As demand for the system's services or content of the database increases, additional modules can be added.

REMOTE ACCESS - TELEPHONE

To provide remote access to the CPU, each port will require an auto answer device, allowing the system to accept queries without staff interaction. Some auto answer devices are self-adjusting to the speeds of the incoming calls. Modems operating at 300/1200 baud would be most desirable, as these rates will probably be the prevailing rates for the next few years. The higher speed modems are still substantially more expensive than the average microcomputer user is interested in purchasing, however, the hardware should include at least one 2400 or 4800 baud modem for interconnection to other computer systems that may permit those speeds. Auto answer devices cost approximately $400-$500.

REMOTE ACCESS - CABLE

The SYTEK Inc. modem to be used for the test outlined in this document is currently priced at $500 each and and must be bought in pairs. Modems are required on the computer and user end. The modem will interact with the users, however, at much higher speeds than those that will be interconnected by telephone, probably 9600 baud.

MODEL DATABASE HARDWARE CONFIGURATION

For the planning project a Digital Equipment Corporation LSI-11/03 computer system was used. The system used the DEC RT-11 operating system, and the experimental programs were written using a special semi-compiled multi-user Basic language, developed by EMDA Inc.

The test-system utilized a 10 MB disc drive (5 removable and 5 fixed) of the winchester type, manufactured by DMA Systems Corporation of Goleta, California. The controller for this drive was a DILOG DQ614 Q-Bus device, and the formatter was provided by DILOG(DQ634), which proved to be completely compatible with the RT-11 operating system mentioned above, and the DMA drive. The test system utilized 64k bytes of memory (Q-BUS dual slot), and a DLV11-J SLU (four ports).

Generally a DEC VT100 terminal was used for data entry, however, microcomputers were also used, in their terminal mode as were IBM-3101, Data-Media, General Terminal Corp. SW/10 and other terminals with ANSI or VT-52 mode options. For the test programs, some of the special capabilities of the VT100 were used, such as underline, bold, blink, etc. However, since one of the basic requirements of the system is compatibility with a number of different kinds of terminals and systems, these embellishments were employed on a very limited, non-essential basis.

Although the test system was not intended for use by more than two simultaneous users, in the real-world situation, a single DEC LSI-11/23 would be able to support at least several simultaneous users.

X. HARDWARE RECOMMENDATION

The system design recommended for a working system, could take several forms, but should have the following specifications:

1. The system should be able to grow from 3 or 4 ports, to 30 or 40 ports. The databases are designed so that the average connect time will be three to five minutes. Forty ports operating for 10 useful hours per day, will provide (40 x 12 x 10) 4,800 potential accesses per day, probably more than adequate for the first two years of the system's operation.

   It may be a required that controls be placed on users that will permit the balancing of the system loading throughout the day. These controls could be of various types ranging from access fees that may vary according to time of day, to a limited number of unit access per day per user.

2. The system should be as low cost as possible. If the cost of the system is too high, libraries will have a difficult time with funding.

3. The system should be reliable, providing system access during all days and hours library is open and eventually after library hours. Additionally, the system design should allow for preventive maintenance without taking the system down.

4. The system design should guard against obsolescence. Care should be taken that the system has interface capabilities with a wide variety of potential devices, and systems, as well as providing capability to expand as the use of the system increases.

Since the test system was developed on a DEC LSI-11 system, the natural progression would be to use a configuration of DEC machines that would answer the above criteria. This can be accomplished in several ways, depending on the desired capacity of the proposed system.

By using a configuration that consists of linking smaller computer units together to make a larger system, we can accomplish most of the goals for the hardware. This linkage is not unlike the so-called Local Area Network (LAN) system, except that the various components would actually be located adjacent to one another. EMDA has used similar configurations for other systems it designed and found excellent results.

Probably the most desirable building block in terms of original cost, easy maintenance, and upgradability, would be the DEC MICRO-11 computer or the DEC 11/73. The basic design (i.e. use of the Q-bus) is such that the maintenance and expansion costs are relatively low and the general performance/cost ratio is excellent. A wide variety of peripheral devices are available through a growing number of different suppliers.

A combination of four or five of those systems linked together should adequately meet objectives for the first several years. As additional growth becomes necessary, extra MICRO-11 or 11/73 modules or state of the art counterparts could be added.

While DEC components and systems are suggested in this report, it should be stressed that there are many other manufacturers of comparable equipment that could be used. DEC is prominently mentioned here only because it was a DEC system that was used during this study.

A SUMMARY OF SOME OF THE SYSTEM'S DESIGN OBJECTIVES

1. High reliability.

   The system should be accessible to the public 24 hours per day and should have minimum downtime.

2. Maintenance and upgrade costs must be as low as possible.

   There should be no requirement for premium maintenance contracts (i.e. 2 or 4 hour call, etc.)

3. Security.

   While security may not appear to be a major problem at first glance, it is important that the system be designed from the ground up with adequate security to prevent users from "tinkering" which might cause embarassment and perhaps financial loss.

4. Ease of Use.

The user must be able to use the system with a minimum of training. Little use of the typical computer system manuals should be required, both because of the cost factor, and the difficulty that many users have with them. Instead, the system should be as self-instructional as possible.

5. Incremental growth.

The system should be designed to grow incrementally, as the use and features expand. It should not be necessary to require that a computer larger than is needed now be purchased in order to meet potential demands of the future. Instead, the system itself should permit adding modules if and when it is required.

6. Universality.

The system should converse with as many other types of terminals, and microcomputers, as is practical, to the extent that they have ASCII communications capability. The system is interactive on a character-by-character basis, making it possible for even the least expensive terminals to be used, and for the computer to check the data being entered on a character-by-character, and a line-by-line basis.

XI. IMPLEMENTATION

The primary goal of the LSCA planning grant was to determine the feasibility of delivering local information using two-way interactive cable television. In addition to identifying community needs, detailing the hardware and software requirements, and identifying funding sources for such a project, the Steering Committee developed an implementation plan. As the Committee worked with community representatives, Library staff, and the consultant, it became clear that the project would meet the identified goals in the grant proposal, as well as the objectives identified in the Community Analysis.

In order to implement the system in a reasonable time frame a phased approach will be undertaken. Phase I calls for availability of one database by early 1985 at the Central Library. The Steering Committee determined that the Calendar of Events will be the first database implemented. In mid-1985, the Community Organizations and Decision Makers databases will be available in the Central Library and eight branches. In early 1986, the last three databases, Statistics, Business, and Library holdings, will be activated in the Libraries and in dial access mode from various City locations. Residents will then be able to dial into the system. By July, 1986, it is hoped that Falcon Cable TV will provide two-way interactive transmission of data.

Within the next 18 months, each database will be constructed. Additional software refinements are necessary, particularly in the area of access points and retrieval. The Steering Committee will meet with the librarians responsible for the databases, and the consultant to work on refining the system. Standards for data entry, including forms of headings and subject terminology still need to be developed. Data entry will not begin until these standards are set.

As with the planning project, responsibility for implementation of PALS will rest with a variety of staff. The Principal Librarians for Reference and Support Services will be responsible for software and hardware development respectively. The Steering Committee and the six subcommittees will continue to oversee the development of the databases, working on data collection, data entry and refinement of the retrieval system.

COST

When implementing a system like PALS there are a variety of direct and indirect costs that need to be determined. Cost planning includes hardware and software costs, maintenance costs, telecommunications costs, staff costs, computer environment/housing, supplies, publicity, etc. Clearly all these costs will depend on the approach taken, either contracted/leased services or in-house operations.

One option for implementation presented to the Library was acquisition of the hardware and software necessary to operate the PALS. The Library would purchase the necessary central site hardware to operate the system, terminals, and modems to be located at the Library. The cost would depend on the number of access ports, amount of disc storage required to house the data, printers, number of terminals required to meet staff and public use demands for access to the system at branches, central library and remote sites. EMDA, Inc. has estimated that the hardware necessary to provide for storage of 5 databases, system maintenance utilities, 15 access ports, 16 pair of modems for 8 branches, 10 remote printers and 1 central printer will cost approximately $60,000-90,000. Terminal requirements will depend on the ability to use existing terminals. The cost estimate is based on the anticipated need to acquire additional terminals. With 15 access ports, each branch could have 1 terminal and Central Library could have 4 terminals. One terminal would be reserved for the data entry/edit terminal and the remaining ports would be reserved for dial access. Total terminal costs range from $10,000-$39,000, depending on the selection of intelligent or dumb terminals. Printer costs depend on type of printer, print speed, and print quality, and range from $400 for a dot matrix printer to $3,000 for a laser jet letter quality printer.

In order for the system to be accessible by remote sites or dial access, modems and automatic answer devices must be budgeted. The branch libraries will require modems whether operating on dial access or dedicated phone lines. Depending on speed and features such as diagnostics, auto answer, number storage, etc. the prices range from $100-$1500. In accommodating dial access devices, an auto answer device is a recommended addition, eliminating staff need to connect the user to the system. Combination 300/1200 baud devices with auto answer cost $400-500.

Software costs are less concrete than hardware because the software system will be continually refined. EMDA, Inc. anticipates that the license fee for software will be $30,000. In addition to this one time cost, the software maintenance fee will be approximately $150/month. Additional programs and enhancement to the system will be contracted. In addition to cost of the software package, there are costs associated with purchasing and loading existing machine readable files. Royalty fees may be charged by certain agencies or organizations.

Maintenance fees which are required for both hardware and software are dependent on equipment requirements. Hardware maintenance should be available from local equipment suppliers and should be a consideration in selection of equipment. For a 15 port system, hardware maintenance is estimated to be $600-900/month. More specific information on system requirements is necessary to determine exact costs. Additional monthly maintenance fees may be assessed for software maintenance. These fees will vary depending on degree of maintenance, if that includes modifications or enhancements, if service is available during working hours, weekends, response time, etc.

Although the newer micro-based systems do not require a special environment, some hardware systems may require that the Library house the system in a special environment - a computer room. This room should be designed in accordance with the requirements specified by the hardware vendor, but generally includes a room whose temperature does not exceed 80 degrees, that is as dust free as possible and allows for adequate electrical and telecommunication connections. Raised false floors, accommodating the many cables is recommended. Cost estimates for a 750 sq. ft. computer room can be in the range of $70,000.

Another option of timesharing computer facilities exists for libraries not wishing to undertake responsibilities of a computer while proceeding with the project. EMDA proposed the leasing of computer facilities during the next phase of the PALS project. Selecting this option allows the Library to proceed with the development and testing of the project while not taking on responsibility for the central site. While not providing the flexibility in terms of system availability, the option of leasing relieves responsibility for system maintenance allowing the staff to direct their energies toward the database creation and refinement. The Library will have to lease or purchase computer terminals and modems for in-Library use. EMDA will provide central site hardware, disc storage space and modems. The lease fee will include hardware maintenance fees on all but the Library terminals. Software maintenance and refinements will be included in a monthly service fee, however development of additional modules will be under a separate service contact.

Telecommunications is the next major concern, particularly since it is in an extremely volatile state. Initially the system will operate in a dial access mode. This type of operation requires voice grade lines and modems. The Library can use existing telephone lines or install separate lines for this purpose. It may be desirable to take the latter approach to assure availability of telephones. The initial installation cost for a dedicated line is approximately $300/per line and a monthly lease fee is $35 per line while dial access lines cost less than $100 for installation and $10 per month lease fee. Depending on the use and availability of the system, dedicated lines may be installed from the Library to EMDA. As the cable institutional network develops these lines may be eliminated.

There are a variety of miscellaneous costs associated with such a project that fall largely into the supplies area. EMDA will provide printouts as required, however costs for publicity, staff training manuals and documentation must be budgeted. If the Library elects to purchase and operate the central site, there are supply costs such as paper, printer ribbons, disc cleaning, computer tape (if a tape system is used), disc packs, cable, cleaning supplies, etc. Cost for these items will vary with the type of system and use. It is important, however, to budget for them.

ONE POSSIBLE HARDWARE CONFIGURATION

(Nine incoming ports - starter system)

3 - DEC PDP/11-23 CPUs

Each includes:

- Minimum memory configuration
- RL02 disk drive
- Winchester 10 m/byte disc
- DLV11J 4 asynch com/ports
- Console terminal VT100
- Parallel interconnectors
- Cabling

Approximate cost - $45,000

ANCILLARY EQUIPMENT

9 modems approximate cost - $4,500
1 printer (med. speed) approximate cost - $1,500
2 additional hard discs approximately - $8,000
(for additional common storage)

Approximate total hardware $59,000

(Fig. 28 One Possible Hardware Configuration)

TRAINING

The PALS system is designed to accommodate users at all levels. First time users should find the databases easy to use. However, orientation will contribute to ease of use for all potential users. The combination of training sessions and printed materials will provide the orientation people need to use the system efficiently. Any training materials developed will need to teach through examples. It is very important that these materials be well written and include screen displays from each of the databases.

Training will be necessary at three levels: first, individuals and organizations involved in the data entry process; second, central and branch staff accessing the system as part of reference service; and finally, Library patrons accessing the system from the Library and from their homes or offices.

Data entry training will include log on procedures (passwords, etc.), format explanations, adding new entries, editing, determination of keywords, searching tips, standard forms, and logging off. The standard forms of names, dates, phone numbers, and abbreviations will make up part of the documentation for the system. Training will not need to be extensive because of the nature of the system, but written procedures and directions for data entry will be mandatory in order to ensure standardization.

Staff training will include how to access the system (from Central or from the branches) and will emphasize searching techniques. It is expected the databases will be heavily used by Library staff in providing reference service to patrons who call or come in to the Library. Because of the timeframe under which most of these questions are handled, retrieval of information would be assisted by training staff in the most direct searching techniques. Staff will be trained to answer patron phone queries about simple system problems as well. Written materials can be limited to a simple reference sheet that describes how to access the system. System documentation should be readily available at the phone and Information Center to answer questions about the system.

Orientation guides could be distributed when patrons register with the Library to use the system from home. It would describe the databases, searching techniques, policies, system use requirements (library card, terminal specifications, modem baud rate, etc.) as well as consequences of system misuse. It could also be made available to patrons using the system in the Library. A simple reference sheet would also help users in the Library.

If the patron is accessing the system from home, he/she will need step-by-step procedures for logging on. These instructions should include system prompts and appropriate user response. Screen displays should be included so that the user will know what to look for in logging on, in searching (both specific and menu searches), and in logging off. A section on what to do to remedy mistakes will also be included.

XII. CONCLUSION

A comparison of the original LSCA grant proposal with what has been accomplished so far shows that all of the original objectives have been successfully met. In fact, the creation of the model database exceeded our original expectations. We have designed an experimental format for several local information databases that were identified as most important by the Pasadena community. In addition, we have designed a communication and delivery method that will reach a broad sector of the community either directly through home cable television or microcomputers, or indirectly through these same media at a number of facilities throughout the community, including libraries, recreation facilities, schools and other public places.

It is important to note that the PALS system, as it currently exists, is experimental. A great deal of work remains to realize an optimum design for content, format and access. As we proceed through the project's implementation, each database will be fully analyzed before final decisions are made. The contract has already been issued for the next phase, during which we will spend considerable time testing the system to ensure that it is designed for optimum use by the users. The importance of working closely with the local cable vendor cannot be overlooked. It was a critical ingredient in the PALS project and will be as essential for other public libraries with similar interests.

Although this project has been generally successful so far, we have encountered a few problems that should be mentioned. One of the problems we discovered early on was the varying levels of technical expertise possessed by the Library staff who participated in the project. In an effort to bring the staff to a similar level of comprehension, a lecture and several discussions were presented to the staff by the consultant. An added advantage was that the consultant learned more about the Library's needs and our expectations for the project from the discussions.

Another problem concerned staff scheduling. Any new project is bound to have an impact on an already over committed staff, especially one that was so large. This situation was mitigated somewhat by drawing on staff from a number of areas including the Central Library and the Branches and by the recognition of the long-term benefits once a system, such as this, is established. Once initial decisions were made about the format for records in the system, we found that it was difficult to schedule staff to go to the consultant's office to enter data. Remote access from the Library would have helped this situation. This access is a high priority for the next phase of the project.

A further problem we encountered concerned the lack of available information on a number of important issues, including copyright and privacy of information. Although we thoroughly investigated these topics, we were able to come up with very little definitive information to use as guidance.

We also found that some of the data we needed to collect for the databases were difficult or time consuming to obtain. The databases that have exact print counterparts, such as Decision Makers, will be fairly easy to put online. Data that we will have to collect and obtain permission in order to use, such as for the Business database, presents a greater challenge. The availability of data is an important issue to be considered by others with similar interests.

The staff working on this project consider these problems as challenges and are looking forward to beginning the implementation phase of the project. The staff feels as though they will soon be able to offer an important new service in an area that has been identified as important to the community.

Footnotes

Footnote #

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